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EXCAVATING ENGINEER

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Two 4-cu. yd. shovels load out limestone as vertical drill prepares bank for blasting in Pittsburgh Limestone Company's Moler quarry at Millville, W. Va. Larger rocks are drilled for secondary blasting.

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August, 1945 Number

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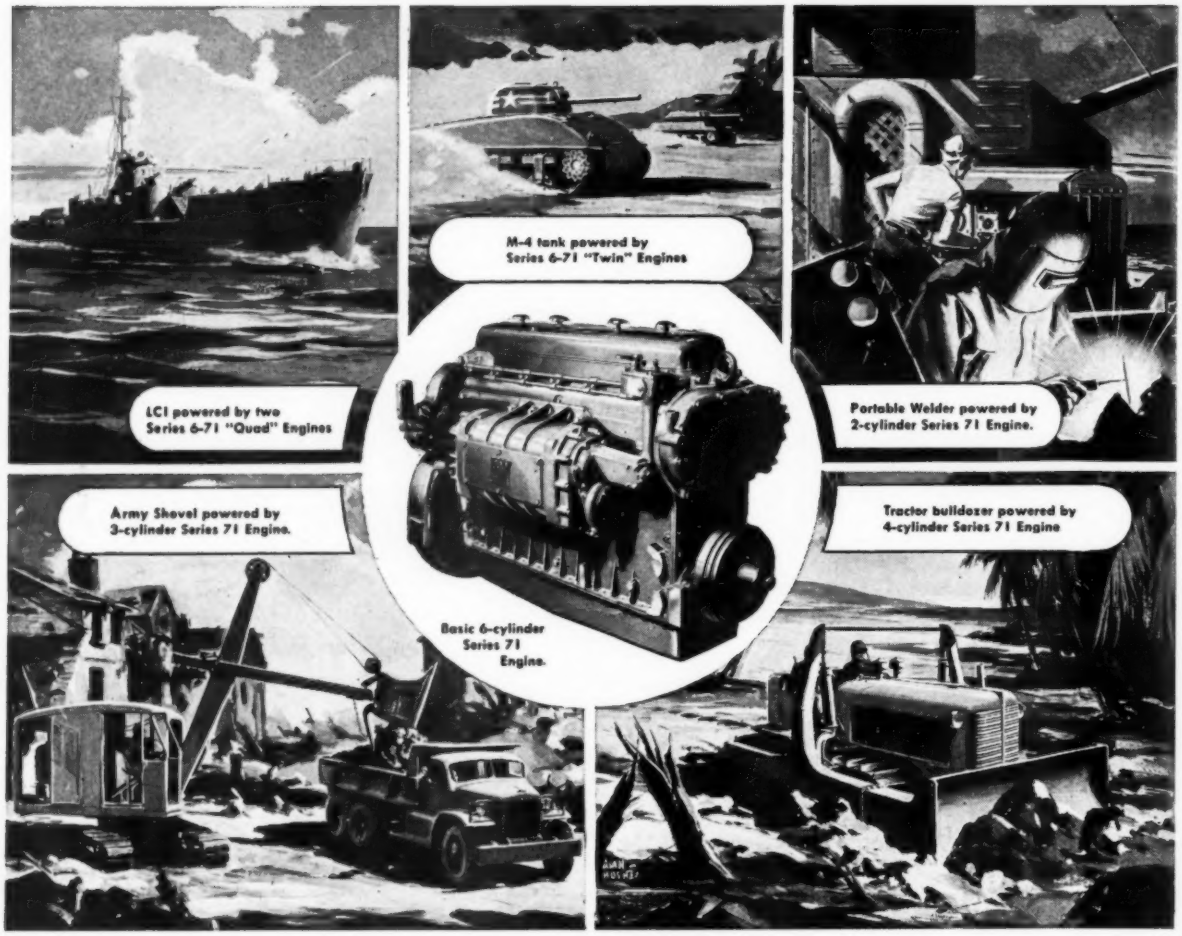
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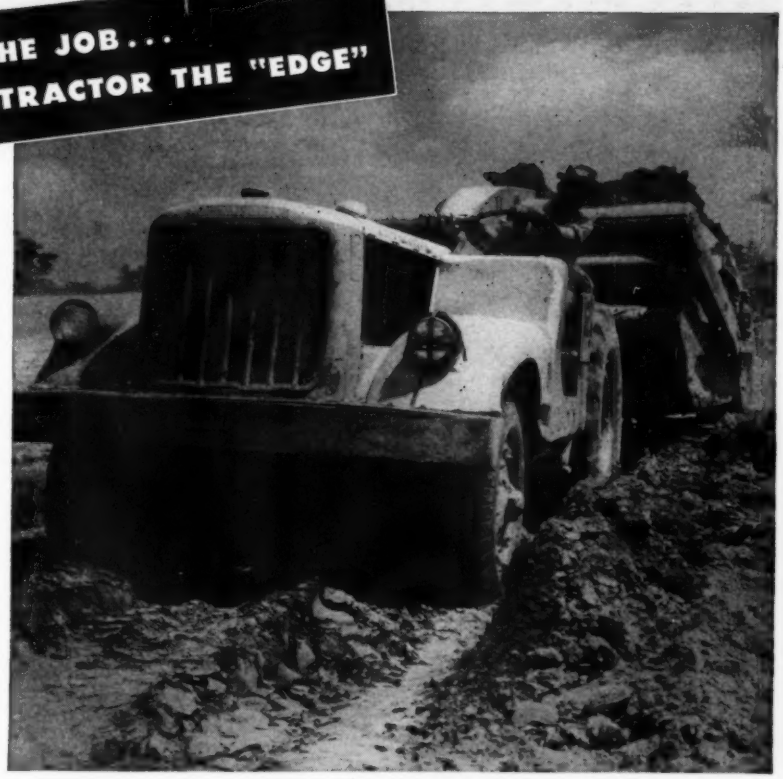

IT WAS a hurry-up job, and Winkelman* did it! . . . because it was organized with equipment thoughtfully "zoned" according to the sphere for which each unit was best suited. That's how the moving of 2½ million yards of earth for the Natchez Airport was accomplished quickly and at low cost.

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23 out of the 24 track-type tractors used were "Caterpillar" Diesels.

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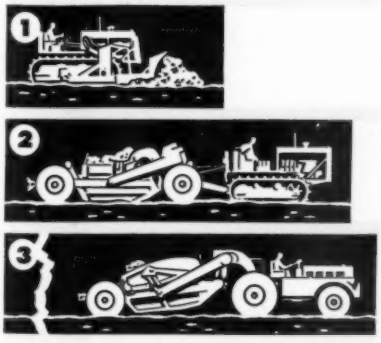
The 7 motor graders used were "Caterpillar" Diesels.

*D. W. Winkelman Co., Inc., contractor. Illustration shows only a small portion of equipment used on project.



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Maumee Mines Indiana No. 7 Vein Coal

Problems caused by worked-out underground coal veins beneath the No. 7 Indiana vein being mined and tough overburden are met at Maumee Collieries No. 27 Mine by use of churn drills using 10-inch bits and a bench method of stripping with dragline and shovel.

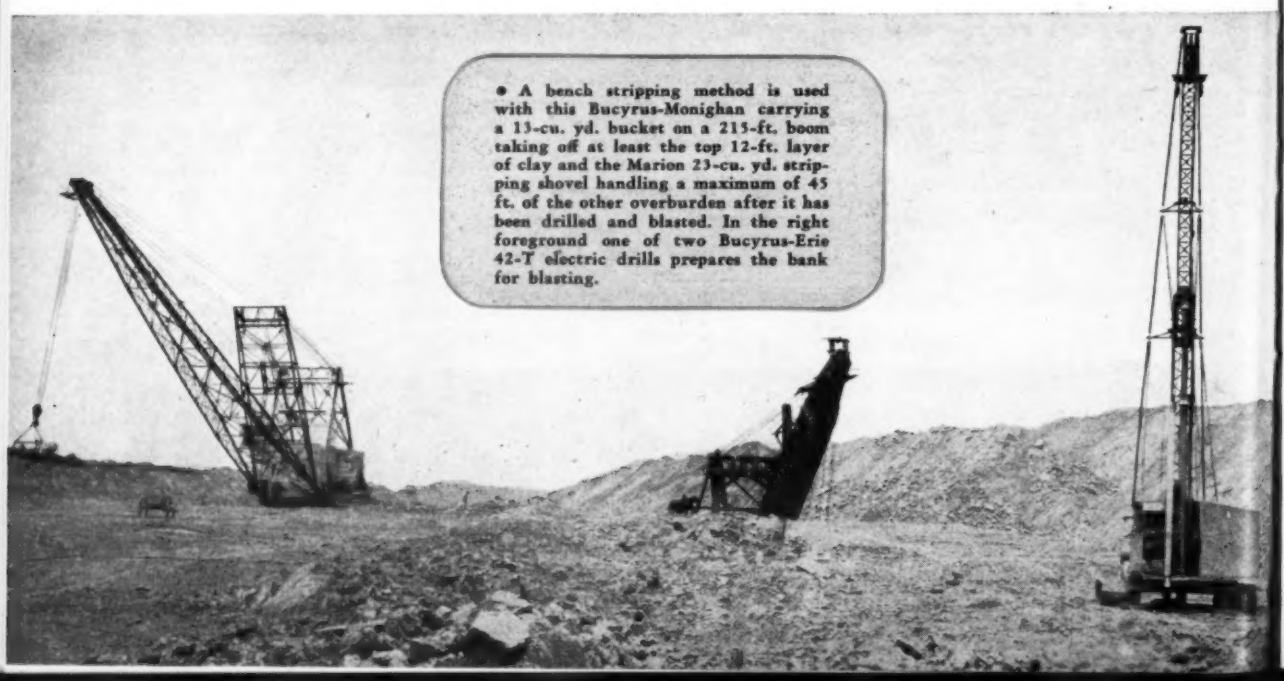
WHEN MAUMEE Collieries opened its Mine No. 27 four miles west of Linton, Indiana, in September, 1944, it was with some misgivings. For one thing, coal from the No. 6 and No. 4 veins had already been mined from large sections of the property by underground methods leaving the possibility of cave-ins when the heavy stripping shovel started working in the pit over these former drifts. And in addition to this, it was No. 7 vein coal that Maumee was after and up to this time there had been few large successful open pit mining operations on the No. 7 vein in Indiana because of the extremely tough overburden on this vein and the unevenness of the vein itself.

Now, with almost a year of successful operation in Mine No. 27 Maumee Collieries is through worrying about the special problems that had confronted it in this mine. With special drilling and stripping methods adapted to the conditions found present, Mine No. 27's crew under Harvey Grounds, superintendent, is removing an average of 750,000 cu. yds. of tough overburden a month and producing a monthly average of 50,000 tons of coal. This coal is loaded at the mine conveyor station into 70-ton railroad hopper cars and shipped on the jointly-owned Pennsylvania and Milwaukee Road tracks to a tipple and preparation plant five miles south of Linton which serves the output of four of the company's seven operating pits at the present time. Tipple limitations hold No. 27 mine to five eight-hour day loading operations a week.

Instead of being a possible hindrance, the old underground workings of the No. 6 vein which lie an average of 40 to 45 feet below the No. 7 coal vein in the first pit at Mine No. 27 has been utilized to good advantage as a made-to-order drainage system. Ten drill holes down to the old No. 6 vein mine, seven from the surface and three from the pit, adequately take care of any problems of excess water. Five three-inch suction pumps, two Barnes gasoline and three Fairbanks Morse electrics, pump water from pit puddles, or pockets, to the drainage holes into the underground mine. Water drains from the underground mine into a worked out open pit mine adjacent to Mine No. 27.

The Hamilton Mining Co. worked out the No. 6 vein on the property and abandoned its workings about ten years ago. The Little Betty Mining Company worked out the No. 4 seam at a depth of 170 feet. The No. 5 vein on this property is reported faulty but it is being worked by another mining company immediately east of the property.

Maumee Collieries is an Ohio corporation with its home office in Toledo and its main working office in Terre Haute, Indiana. It was incor-



• A bench stripping method is used with this Bucyrus-Monighan carrying a 13-cu. yd. bucket on a 215-ft. boom taking off at least the top 12-ft. layer of clay and the Marion 23-cu. yd. stripping shovel handling a maximum of 45 ft. of the other overburden after it has been drilled and blasted. In the right foreground one of two Bucyrus-Erie 42-T electric drills prepares the bank for blasting.

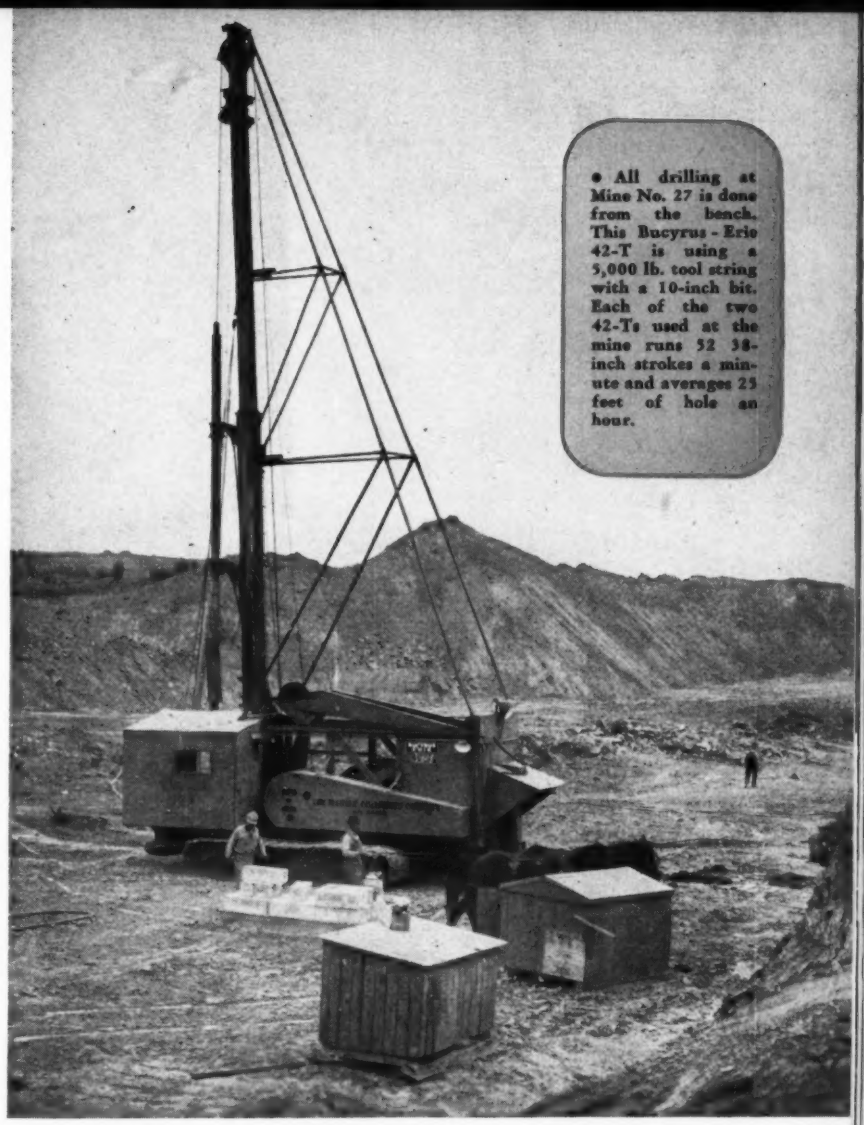
porated on September 12, 1922, and it, and its predecessor companies, have been stripping coal within a distance of 45 miles of Terre Haute since 1911. Maumee now has about 600 employees and with its present four tipples and seven pits is producing about two million tons of vitally needed coal a year. With an average 15 to 1 ratio of overburden moved to coal mined for all seven pits, Maumee is moving 30,000,000 cu. yds. of overburden a year—a lot of dirt in anyone's language.

O. S. Roberts of Toledo is president and treasurer of the corporation; Hugh B. Lee of Terre Haute is vice-president and general manager; David W. Aten is vice-president and secretary, and George W. Rea is general mine superintendent. J. R. Harmon is master mechanic of all mines and Robert L. Akre is superintendent of drilling and blasting for all of Maumee's mines.

Mine No. 27 is installed on a large acreage and will probably produce coal for the next 15 to 20 years. The coal is shipped by the Pennsylvania and Milwaukee Road railroads throughout the Northwestern states and is used by railroads and industries, and for domestic heating plants.

Overburden at this mine varies in height from 30 to 65 feet with an average of 41 feet consisting of a top 10 to 12 ft. layer of clay over about six feet of hard pan of sandy rock and then about 10 to 12 ft. of gray sand rock with 12 to 14 ft. of gray sand shale over the No. 7 coal vein which varies in thickness from 2'9" to 3'7", with an average thickness of 3'4".

A bench method of stripping is used with a dragline taking off at least the top 12-ft. layer of clay and a stripping shovel handling a maximum of 45 ft. of the other overburden after it has been drilled and blasted.



• All drilling at Mine No. 27 is done from the bench. This Bucyrus - Erie 42-T is using a 5,000 lb. tool string with a 10-inch bit. Each of the two 42-Ts used at the mine runs 52 38-inch strokes a minute and averages 25 feet of hole an hour.

Drilling Overburden

Because of the tough nature of the overburden, the bank is normally drilled from the bench and is blasted ahead of the stripping shovel.

Because of the worked-out vein of No. 6 coal beneath the No. 7 being mined, and because of the hard nature of the overburden, there was an especial drilling problem to be met at Mine No. 27. A vertical drilling procedure was adopted for this mine by Drilling and Blasting Superintendent Akre.

Five-inch horizontal holes or six-inch vertical holes were used for blasting overburden in Maumee's other mines. If banks were nice blue shale and not over 50 ft. high, horizontal drilling for shooting worked satisfactorily, but if there were any sand rock or limestone, or thick stratas of hard sand shale in the overburden, horizontal holes were never used in banks of any depth over 30 feet. If horizontal holes were drilled for dragline stripping they were spaced from 14 to 24 feet apart, depending upon the depth and hardness of the bank, and they were loaded for a ratio of from four to ten cu. yds. per pound of 60% weight strength powders. The holes were loaded with a dense powder, such as Hercules 85, or 60 Gel. extra, for the first six or ten feet, and then a powder such as Hercules 81-B or D was loaded to bring the column out within 12 to 18 ft. of the collar of the bore hole.

Akre holds that where the overburden is soft enough for horizontal drilling it allows a fairly cheap drilling cost, but when the overburden is harder and the bank is over 30 ft., the explosive ratio gets out of line with horizontal holes because of the extra effort that has to be put forth to shoot straight up through the bank from the back of the hole. When vertical holes of six-inch diameter were drilled in Maumee's mines they were usually spaced so that any foot of the bore hole could be loaded with the maximum load required for the number of cubic yards each foot of hole was carrying. It was usually assumed in the Maumee mines field that about eight yards of shale, about four yards of sand rock, and about one yard of limestone can be broken per pound of 60% explosive for dragline stripping. These ratios, of course, vary in different banks.

Using the foregoing ratios for an example, if Akre were setting up a spacing for six-inch holes in lime rock they would be spaced 20 x 20, 20 ft. long and 20 ft. wide measuring straight across the second row. This would give 14.8 cu. yds. per ft. of drill hole. These holes would then be loaded with 15 lbs. of 60% Gel. extra per foot of limestone drilling. This also takes into consideration that the displacement of limestone is about as

• **Above: Pit view of paired dragline and shovel. The dragline is just starting on a new cut and will follow the stripping shovel along the bank. Left: Material spoiled by the dragline is dumped behind the stripping shovel's spoil pile.**

important as the breakage and ten cu. yds. per lb. of explosives is about as high as can be used and still get enough displacement with the shot.

If sand rock were to be shot the holes would be spaced 22 x 24 and loaded with a powder, such as Hercules E. P. 81-B, which loads about eight lbs. to the foot in a five-inch stick.

Maumee Collieries decided that drilling larger vertical holes would very much reduce the drilling cost and the loading ratio would probably not be materially affected and so purchased six Bucyrus-Erie 42-T blast hole drills capable of drilling 12-inch holes.

Two of these 42-Ts were put to work at Mine No. 27 and the two together put in a total of 32 hours of running time a day for six days a week.

The 42-Ts normally work from the bench and each uses a 5,000 lb. tool string with a 10-inch bit. Each machine runs 52 38-inch strokes a minute and averages 25 feet of hole per hour. In earlier drilling, in 16 to 20 ft. of overburden, 12 holes per machine were drilled in one eight-hour shift regularly. These machines have drilled as high as 314 ft. each in an eight-hour shift. The holes were spaced 27′ x 30′ and shooting is done 54 ft. back from the face because it was found that better fragmentation was obtained by using this much buffer.

The drills are electrically powered and it is estimated that they use about 100 k.w. hours a day of 440 voltage current. About 20 gallons of water per minute is run to each drill while running water is necessary. The water is brought from a 15-acre lake of rain water through about three-fourths of a mile of two-inch pipes at 125 lbs. working pressure. About 1,000 ft. of 1½-inch rubber hose carries the water from the pipe lines to each drill. A 60-gallon Gardner - Denver pump sends the water through the lines. During winter operations less hose line is used and fires are kept under the pipe lines.

The 42-Ts are equipped with hydraulic levelling jacks, two in front under the operator's platform, and one in the center rear. Experience at this mine has shown them to be a wonderful time-saver in setting up for new holes. No manual blocking is necessary and the machine can be levelled within a few minutes by manipulating three light levers at the operator's station. These drills are also equipped with special 36-inch wide caterpillar mounting treads.

It is estimated that, not including depreciation, an average of about 30% of the drilling and blasting cost is labor and drill supplies and that about 70% is cost of explosives.

An average of about 100,000 pounds of explosive was being used a month at the time the writer visited Mine No. 27. However, drilling and blasting procedure is still in the experimental stage and it is expected that a wider spacing of holes will be used and more bulky explosives will be tried to attain the most economical drilling and blasting cost.

Drill bits are reshaped and sharpened at a centrally located company bit dressing shop in Linton. Bits used at Mine No. 27 are redressed and sharpened after an average of eight hours of drilling. In the three or four days a week that the shop is operated an average of 22 bits are dressed a day, although the shop is capable of turning out 32 dressed bits a day with its three-man crew.

The bit dressing shop includes an Armstrong No. 6 bit dresser with special modifications designed by Akre so that it can handle up to 10-inch bits. The die used is also of

Akre's design and was made especially for this shop and is radically different from the ordinary bit dressing die in placement and depth of curvatures. Other shop equipment includes a Bucyrus-Erie oil fired bit dressing furnace, two quenching tanks with bit racks and a manually operated Johnson & Moore "Cyclone" chain hoist arranged so that bits can be handled to the furnace and from the furnace to the bit dresser and to both quenching tanks.

Stripping Method

Stripping equipment used at Mine No. 27 includes a Marion 5480 stripping shovel equipped with a 23 cu. yd. dipper on a 95 ft. boom and 64 ft. dipper handle, and a Bucyrus-Monighan 15-W walking dragline with a 13-cu. yd. Red Arch medium duty bucket on a 215 ft. boom. The Marion was originally equipped with a 14-cu. yd. bucket, but with some minor adjustments and the addition of more counterweight on the back of the shovel a new lightweight 23-cu. yd. dipper was substituted. The new dipper weighs but 2,000 lbs. more empty than the old 14-cu. yd. dipper but the weight of the additional nine cu. yds. of overburden handled with a full dipper puts a recognized overload on the machine which causes quite frequent renewal of some parts of the machine, especially the roller rack. However, it is felt that the additional output is worth the cost of replacing parts. Auxiliary stripping equipment includes Allis-Chalmers tractors with Baker bulldozers used on the bench and in the pit to clean up.

The stripping shovel and the dragline, along with the Marion 490 3½-cu. yd. loading shovel used were moved overland four and one-half miles from Maumee's Mine No. 23 when operations started at No. 27. The Bucyrus-Monighan walked the distance in 22½ hours walking time, and the stripper averaged about 1,000 feet a shift moving on mats on the overland trip from the other mine.

With the bench method of stripping used at the present time, the Bucyrus-Monighan dragline takes off at least the top 12-ft. layer of clay. The remainder of the bank, up to a maximum of 45 ft., is stripped by the Marion stripping shovel after it has been drilled and blasted.

Stripping operations were started in September, 1944, by the Bucyrus-Monighan 15-W dragline which dug in near a haul road near what is now the northern end of the first pit. The dragline made the first cut, 80 ft. wide, the entire length of the pit, first working on a northwesterly leg, or one leg of the extended "U". After completing this stretch the dragline then came back to its original digging spot and worked southward on a straight line and then cut a leg westward at the south end of the cut. After making these three 80-ft. cuts the dragline was moved to adjoining Mine No. 26 where it assisted the stripping shovel in that mine and the Marion stripper was brought into the cut at Mine No. 27.

The stripping shovel worked the established pit in successive 48-ft. widths using the legs to turn around in. A maximum 90-ft. bottom width was maintained, made up of a 42-ft. berm and the 48 ft. cut made by the stripping shovel. When heavier overburden was encountered in May, 1945, the 15-W was brought back to Mine No. 27 to assist in the bench stripping procedure.

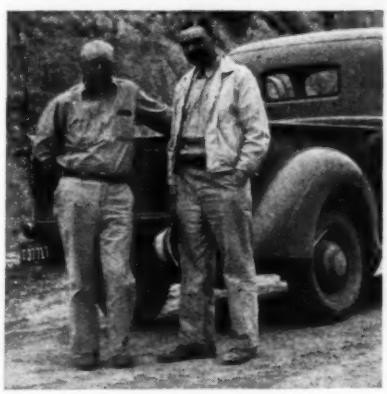
When the dragline was brought in, the shovel began stripping a 70-ft. wide cut instead of a 90-ft. wide cut, leaving enough room for it to turn around in. The dragline made its first cut 12 feet deep working southward along the high wall adjacent to the pit. Digging ahead of itself the 15-W dumped its spoil on a quarter swing between the shovel's last 90 ft. cut spoil pile, and then turned and worked back northward dumping its spoil between the 70 ft. and 90-ft. cut piles, establishing a 215 ft. bench which is being maintained as stripping continues.

The dragline works behind the stripping shovel and if it gets caught up with its work it is used to make stub cuts at each end of the pit. If, with this extra cut work, the dragline catches the stripper, as occasionally happens, it assists the shovel by taking more than its regular 12-ft. cut from the 48-ft. adjacent to the high wall which the shovel will strip next. The amount of material over 12 ft. that the dragline takes on the 48 ft. next to the high wall varies with the speed at which the stripping shovel is able to work at the time.

It is expected that it will take about one and one-half years for stripping and loading operations to be completed in this first pit at Mine No. 27.

• Coal is loaded out in 48-ft. cuts by this Marion 3½-cu. yd. shovel. Darts and Autocars with Austin-Western 25 and 20-ton trailers are used for hauling the coal out of the pit.

• Harvey Grounds, left, superintendent of Mine No. 27, and Robert Akre, drilling and blasting superintendent of Maumee Collieries Mines.

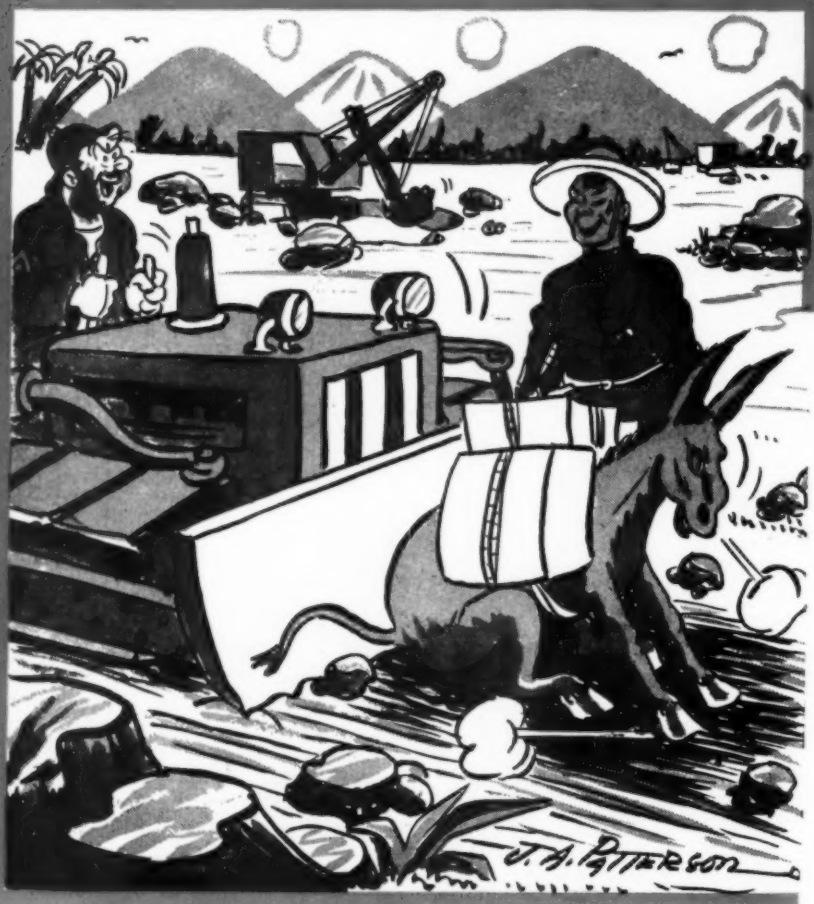


Uneven Coal Vein

The wavy and rolling nature of the coal vein with dips as deep as 10 ft. in about 50 ft. brought up problems on how to strip to the coal vein. At first it was decided to establish a level and strip to this level throughout the pit. Coal encountered above this level was dug by the stripper and dumped behind it. It was then bulldozed into piles and salvaged by the loading shovel during its regular coal loading

(Continued on page 469)

Where There's a Will —



"He's stubborn, all right, John — but there ain't nothin' th' Seabees can't move!"

Seabee ingenuity finds a way to use modern excavating equipment to do unusual jobs in the Pacific area of operations.

By R. P. DAY, CCM, USNR

Where there's a will, there's a way. Seabee ingenuity, plus modern excavating equipment, has accomplished wonders in the fight against the Japs and there seems to be no end to novel methods and adaptations of equipment to get difficult jobs done in the Pacific Area of Operations.

One Seabee battalion, among countless accomplishments, used excavating equipment to refloat a beached landing ship to enable it to engage in an amphibious operation on schedule. The battalion also adapted a light crawler crane to speed the construction of quonset huts, and the same group proved conclusively to doubting Thomases that scrapers are an efficient excavating tool in coral.

Following is a brief description of these three unusual operations written by a member of the battalion who not only saw the work done, but assisted in it.

Excavating Equipment Used to Refloat Landing Ship

WORKING IN THE middle of the night, this Seabee battalion at an advanced base refloated a beached landing ship in five and three-fourths hours, using ordinary dirt-moving machines.

The ship, an LSM, had been beached at high tide, apparently at fair speed, because when the water receded she was hung on the sandy coral beach from her bow halfway back to the stern. When the tide came back she stuck fast. All efforts to dislodge her under her own power failed.

The ship was scheduled for an amphibious operation in 12 hours, and a real emergency presented itself, because the change in plans her absence would have caused would have been extensive.

The Seabees built a coral jetty from a point aft of the ship's beam and curved it into the beach on the starboard side. Using a dragline, they excavated a ten-foot deep channel 20 feet wide along the port side, while a bulldozer dug a trench along the somewhat higher starboard side. When the tide returned the dragline broke the jetty open and left the ship surrounded by water, all except the narrow ridge underneath the LSM.

Two LCTs made fast to the sides of the LSM, and all three ships' propellers began to throw a flood of water into the coral sand ridge underneath. Two tugs hooked on, and bearing out to sea, tugged their best. Nothing gave.

Suddenly the bulldozer operator had an idea. Signaling to the LSM's bridge, he had the forward ramp of the ship lowered. The big tractor dug in, lowered its blade against the ramp, roared in first gear, and that was the push it needed. The ship quivered, shook and began to work free! As

she drifted off, the bulldozer, with salt water splashing from its fan blades, reversed and returned to the shore.

Seabees estimated that they moved about 450-cu. yds. of coral and wore out everybody's nerves in the hectic five hours and 45 minutes it took them to get the 2500-ton vessel free.

Scrapers Prove Efficient Excavating Tool in Coral

TRACTOR-DRAWN scrapers, operated by Seabees in the Marianas, are proving the point of view of men who have argued that this machine is an efficient excavating tool in coral. There has been much pro and con discussion on the matter, ever since the first construction workers first tried to move this type of material with scrapers at Wake and Midway in 1940 and 1941.

Seabees operating under Commodore W. O. Hiltabidle, USN, officer in charge of this Naval Construction Brigade, are moving approximately 100,000 cu. yds. of Marianas Islands coral to backfill the 50-ft. section behind a steel sheet pile dock. They are using Bucyrus-Erie Model S-90 scrapers of eight cu. yd. (struck) capacity, towed by Allis-Chalmers HD-14 tractors equipped with Buckeye cable controls.

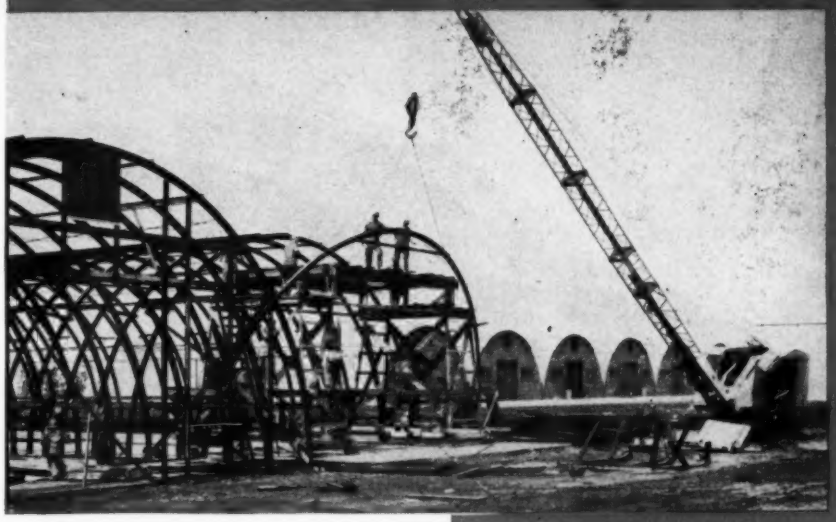
The coral being handled runs the range from 12-inch coral rocks to fine coral sand. Coral rock is difficult to load, and embedded rock cracked the cutting edges of the scrapers, making arc welding necessary. Loading in coral rock, the machines required an Allis-Chalmers HD-10 mounted bulldozer as a push cat, but when a push cat was used the scraper bowls loaded level full, even in rock.

The excavation of backfill material was so planned that perhaps 75% of the coral was loaded out of fill sections where fine coral sand had been deposited by dredging. No push cat was required in this material, and the drawbar power of the tractors was enough to load the scrapers heaping full. Of the four scrapers used, two were built up with steel plates at the top of the back end of the bowls, increasing their capacity to 11½-cu. yds.

Contrary to the lesson learned at Midway, it is not necessary to "gouge" the scrapers in the Marianas to pick up a load. The material loads best when picked up in about a four-inch layer, for then it boils up through the center of the bowl perfectly, falling forward and backward to fill up the scraper. Field studies made by Seabee officers, and observations of the operators on the job, indicate that the loading efficiency of the scrapers can be figured at 85%.

Hauling conditions were good on this job. The roads were level, and damp, but never mushy. Tractors loaded in first gear, traveled in fourth gear, and dropped down one gear to dump and turn. All backfill material was dumped in thick lifts, from 12 to 15 inches, and no compaction was needed. Round trip haul for this work varied from 300 to 1900 feet, averaging 1400 feet. The machines made four round-trip cycles per hour, working 18 hours a day.

Neither scrapers nor tractors showed any inclination toward mechanical failure in four months work. A bulldozer truck frame plate sheared a few bolts back at the bearing block, but these were re-drilled and larger bolts installed. Ordinary routine maintenance and greasing on the job were sufficient to keep the machines working. The Seabees insist that the scraper has proved itself in Marianas coral.



• Bucyrus-Erie ¾-cu. yd. crane with 60-ft. boom speeds quonset hut erection by hoisting in one piece the ribs that arrive in three pieces and are erected on the ground. Crew, on working jumbo, is ready to receive the rib.

• Four Bucyrus-Erie S-90 scrapers attached to Allis-Chalmers HD-10 tractors, like the unit pictured above, are used to move coral in the Marianas.

Light Crawler Crane Speeds Quonset Work

BY USING A LIGHT crawler crane and a homemade working jumbo, the Seabees have speeded up the setting of prefabricated structural quonset hut ribs at a Pacific base to a point where two quonset warehouses can be finished in eight hours by 30 men. Each building covers 4,000 square feet of space and involves the handling of 25 structural ribs.

These ribs are shipped knocked down in three pieces, but by using a ¾-cu. yd. Bucyrus-Erie crane, they can be erected on the ground and then

(Continued on page 466)

Farm Improvement by Excavation

Neal Hawkins, Gastonia, N. C., contractor, used his excavating equipment on his nearby farm and started a farm improvement program among farmers for miles around.

By L. H. HOUCK

• Man-made lake on Neal Hawkins' farm near Hendersonville, N. C., is a valuable asset to the farm.

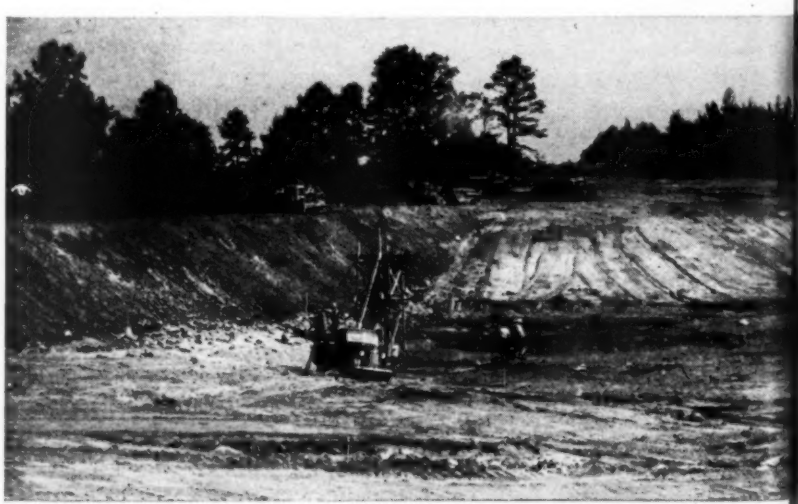
FARM IMPROVEMENT work is seen by Neal Hawkins, Gastonia, N. C., contractor, as a valuable source of postwar work for owners of excavating equipment. Hawkins' prediction is based on a recent experience when he used a ⅜-cu. yd. dragline and a Bullgrader on his own 1,500-acre farm near Hendersonville, N. C., to make some improvements.

He brought a Bucyrus-Erie ⅜-cu. yd. dragline to the farm, principally to dig a ditch to drain a section of his land. Later he brought out a Bucyrus-Erie Bullgrader to level some of the land. With the dragline and Bullgrader he excavated a lake on the property and built a good road to the state highway. He also used this equipment for clearing some of the unworked land of trees and stumps.

Mr. Hawkins expected to bring his equipment back to Gastonia as soon as he finished the work on his farm, but other farm owners for miles around who saw the improvements make on Hawkins' farm rented the equipment and its operators for similar work on their farms. Work on neighboring farms has kept the dragline and Bullgrader busy improving farms in western North Carolina. He is getting requests from all over North Carolina to build farm lakes, but due to war work he has not been able to construct the number he would like.

A pond, or lake, on a North Carolina farm is not just something to please the owner's fancy. It is a valuable asset to the farm. In May, 1945, the state supplied all farmers with ponds on their land with 1,000 sunfish or 100 bass per surface acre if the ponds were fertilized and with 500 sunfish or 50 bass per surface acre if the ponds were not fertilized. This fish allotment was provided for all ponds up to five acres. Larger ponds or lakes came under another method of allocation. Besides being a source of sport and pleasure the fish-stocked ponds are valuable in the control of soil erosion and provide an ideal place for watering stock.

The method used by Hawkins to excavate the eight-acre lake on his



• Bullgrader levels off crest of dam formed by dirt hauled from the lake excavation by two Bucyrus-Erie 9-cu. yd. four-wheel scrapers at top of runway in center rear.

farm is similar to that used on most farms in the area. The site was determined by selecting the best location for watering stock and also raising fish. Bulldozers and draglines were used to clear the site and dirt excavated was used to construct dams and dikes. Muskrat holes which were encountered were filled with red clay. Water for the lake comes from springs. This lake is 70 feet in the deepest place and involved excavation of 50,000 cu. yds. which took 11 weeks to complete. Cars can be driven across the dam. When construction eases up after the war it is planned to build a camp at the lake.

Neal Hawkins has handled excavating and road construction jobs in four southern states and was the first contractor to move dirt on the Wilmington, N. C., shipyard project. Construction of this shipyard, one of the largest in the nation, involved moving 500,000 cu. yds. in four months. Other jobs included the construction of the Basic Training Center, Greensboro, N. C.; Army Bombing Range, Myrtle Beach, S. C.; housing projects at Newport News, Va., Columbia, S. C., Charlotte, N. C.; Plantation Pipe Line Terminals, Charlotte and Greensboro, N. C., and several other Army and Navy excavating jobs. Operations are generally carried on in North and South Carolina, Virginia and Georgia.

One of his recent jobs was excavating for a government warehouse in Charlotte, N. C. This 9,000-cu. yd. job, in red clay, was completed in about a week with two Bucyrus-Erie 12-cu. yd. four wheel scrapers.

Equipment owned and operated by Hawkins includes: two International TD-18 tractors with Bucyrus-Erie bulldozers, three Bucyrus-Erie scrapers—two 12-cu. yd. and one 9-cu. yd., a Bucyrus-Erie ¾-cu. yd. shovel and a Bucyrus-Erie ⅜-cu. yd. shovel, both with dragline front ends, Bucyrus-Erie Bullgrader on TD-6 tractor, a sheeps-foot roller, and a Rogers Carryall trailer. Hawkins has owned 15 draglines in the 20 years he has been in the excavating business.

"Large scale cattle raising, dairying, sheep raising and increased crop production make farming a big business and require improvements that call for the use of excavating equipment. Regular farm equipment is too light to handle this type of work efficiently and the use of regular excavating equipment enables work to be completed at the right time of the year so as not to interfere with regular farm operations," Hawkins says.

He also owns and operates the Hawkins Coal Co., Neal Hawkins Transfer Co., Inc., and Petroleum Transportation, Inc., all in Gastonia, N. C., with operations in North and South Carolina. Petroleum Transportation, Inc., is equipped with 10 gasoline trucks which haul gas over the two states.

• Above: Lakes like this are valuable in control of soil erosion and are ideal for watering stock. Below: Bullgrader clearing site for RFC warehouse at Charlotte, N. C.

• Above: Scraper on warehouse job at Charlotte, N. C. Below: Neal Hawkins and son, Neal Hawkins, Jr., talk over plans for a job.

• Scraper loading in part of lake excavation cleared of trees and stumps. Power is furnished by International TD-18 tractor.

• Here is pavement — smooth and level — almost as far as the eye can see. Only one-third of this Seabee-built airfield shows here.

SEABEE SPOOR

By **J. DUNCAN CAMPBELL**

AS ANY EUROPEAN will tell you, some Americans are either blase or unthinking about big things. Size in itself means little to them. Sweeping prairies, rugged mountains and heartbreakingly empty deserts do not stir their imaginations. Familiarity has bred a sort of ennui.

Some people also accept engineering's conquest of the continent without much fuss. Roads slicing cross-country in long, handsome curves — massive dams filling canyons from brim to brim — graceful bridges spanning waterways from shore to shore —all these they take for granted.

Even those who show characteristic American pride are not over-awed. "After all," they say grandly, "it's a mighty big country!"

We are finishing a mighty big war, too. But just how big is it — or was it? Men overseas, particularly in the Pacific, find it almost impossible to answer that question. No matter how they try to describe it they fail. The folks back home don't really understand.

You would think that people living in such a huge country would have some inkling of the size of the earth's water masses, for instance. If they would look at their globes they could see that the Pacific stretches halfway around the sphere — that it is nearly four times as wide as the United States.

But no, they somehow, not having thought much about it, cannot conceive of the fact that when Willie is on one island of a chain, he may be as far from Johnny on a "neighboring" island as they themselves are from Aunt Minnie in Oshkosh.

They laugh at the Englishman who, when he found that his American friend was living in Cleveland, suggested delightedly that he visit some people in Wyoming for a weekend. Yet they are guilty of the same brand of thinking about the Pacific.

"How," wails Willie, "Can you ask me so blithely to look up Johnny? It takes three days to get there!"

Americans should not carry their nonchalance about size into the Pacific. The enormity of the war in that theatre cannot be exaggerated. However, it is true that the human mind has difficulty in grasping astronomical numbers and stellar distances.

Perhaps, then these pictures can help a little. Perhaps by multiplication of smaller things we can arrive at an appreciation of the larger ones.

These photographs show the trail left by war's progress across one small Pacific island. We have intentionally simplified the picture story. We do not show the barracks, the chow halls, the theatres. We do not show the water purification systems. We do not show the ammunition storage areas or the endless miles of roads, telephone wires and fences. We have concentrated on one grand job; the construction of a fine permanent airfield.

Let's do a little simple arithmetic. A Naval Construction Battalion usually comprises about 1200 men. There are over 150 battalions in existence as this is being written, and nearly an equal number of special units. The Army Corps of Engineers had many more men than that, at the height of the conflict.

Now conjure up a mental picture. Visualize those swarms of men with their hordes of machines. Then study

WITH TEN OFFICIAL U. S. NAVY PHOTOGRAPHS

(Continued on page 466)

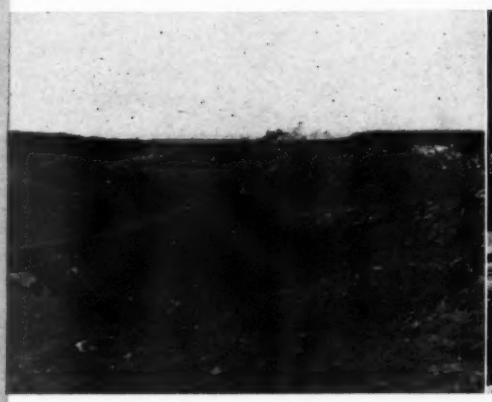
• The Seabees dug material from a tall cinder cone, until —

• They were 140 feet below ground!

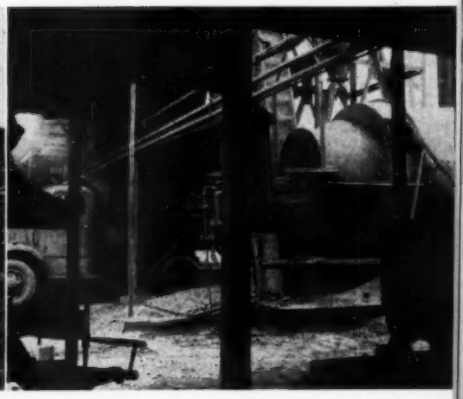
The size of the Pacific Theatre of Operations may be better realized when one gives a little thought to the enormity of the job of but one Seabee battalion working for only one year — and yet this is the trail left by war's progress, and modern excavating equipment, across but one small Pacific island.

• Six acres of empty asphalt drums were left —

• Piled twenty feet high!



• Aggregate was obtained from this quarry —



• And mixed with hot asphalt here.

• Left—This plant was operated by Seabees for a year.

• Above—The crusher rumbled on until —

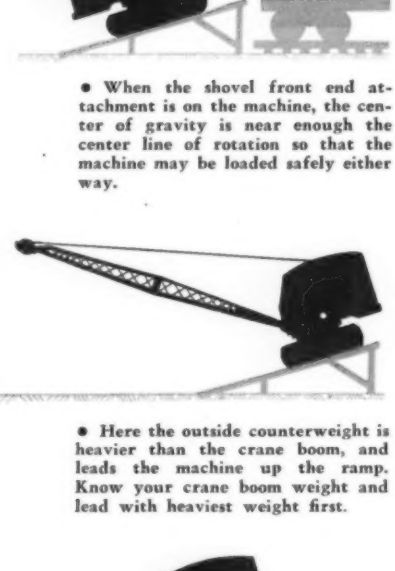
• Right—at year's end the whole area around it was knee deep in grey-white rock dust.

Field NOTES

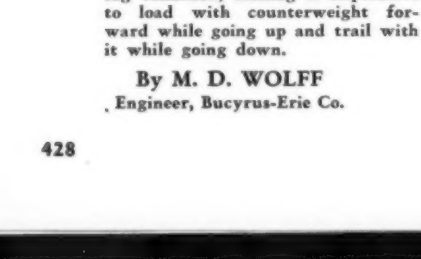
Loading Shovels to Railroad Cars or Equipment Trailers

Care in loading shovels or cranes to equipment trailers or railroad cars always must be taken to avoid tipping, or injury to the machinery. The following rule and illustrations point out the preliminary cautions to observe while loading or unloading (1) a shovel with front end attachment, (2) crane with boom, and (3) machine with no front end attachment.

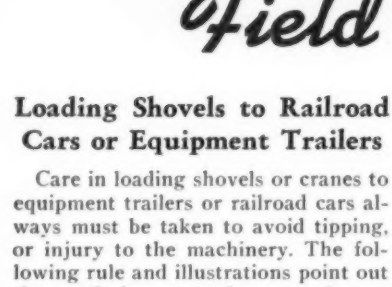
Rule: Going up — lead with the heaviest weight; going down — trail with the heaviest weight.



• When the shovel front end attachment is on the machine, the center of gravity is near enough the center line of rotation so that the machine may be loaded safely either way.



• Here the outside counterweight is heavier than the crane boom, and leads the machine up the ramp. Know your crane boom weight and lead with heaviest weight first.



• A heavy outside counterweight on a machine with no front end attachment shifts the center of gravity back, approaching a critical balancing condition, making it imperative to load with counterweight forward while going up and trail with it while going down.

By M. D. WOLFF
Engineer, Bucyrus-Erie Co.

Saving Equipment and Time

Although the bulk of our business since late 1941 has been on war contracts—which has allowed us the required priority rating for equipment replacements—we have saved money and time by doing most of our own rebuilding and repair work. A well equipped main shop and two- and three-men auxiliary repair and maintenance shops with each unit in the fields are maintained on the job continually.

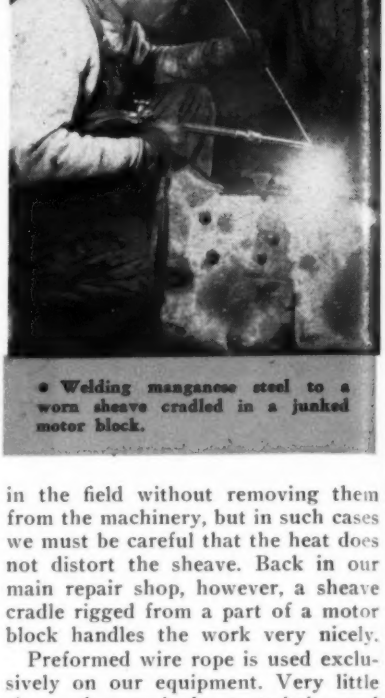
Several pieces of excavating equipment have been built almost entirely from wornout machines and scrap metal. A mobile power-winch, for instance, was fabricated from old parts, junk-pile metal, and parts from retired equipment. We also cut down worn out Northwest dragline booms and used other parts to recondition two Bucyrus-Erie shovels which were in basically good condition. The results were not perfect, but these machines are giving a good account of themselves in steady work with few layups. Three Dumptors were entirely rebuilt and now even new machines do not have all of their original parts.

Welding has become an important part of our repair shop operation. It is used to build up shaft pins, shafting, track pins, drums and sheaves—in fact, just about everything subject to wear.

To date we have used arc welding for all of our work for we are not equipped for metal spraying. In sheave welding, manganese-steel electrodes are used, applied by the skip weld method, with layers not more than 3/16-inch thick deposited on the worn sheave surface. Where the groove wear is greatest, we fill in with a carbon steel electrode before applying the manganese steel. Our records show that sheaves built up with the manganese - steel hard - surfacing rod are giving two to three times the ordinary wear and, in addition, we find that these built-up sheaves are much easier on our wire rope.

We have found that the rough surface of manganese steel rod in the sheave grooves cannot be turned smooth in a lathe. Instead, it is necessary to grind it in a turning lathe with a special grinder, then carefully checked with a gage to bring tolerances back to normal. The resulting hard, smooth surface results in better machine operation and helps give much longer rope life.

Sheave grooves often are built-up in the field without removing them from the machinery, but in such cases we must be careful that the heat does not distort the sheave. Back in our main repair shop, however, a sheave cradle rigged from a part of a motor block handles the work very nicely.



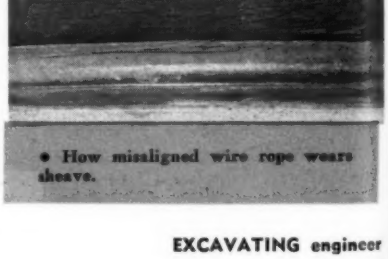
• Welding manganese steel to a worn sheave cradled in a junked motor block.

Preformed wire rope is used exclusively on our equipment. Very little sheave damage is due to twisting and rotating; most of our sheave wear results from bad alignment and from normal hard use.

In our rope-service program we are resocketing, cutting back, switching ends, splicing (where repair requires removal of a section), and placing worn rope ends on the drum where there will be much less wear. Our accident and rope-life records bear out the fact that we are obtaining longer rope life with fewer breaks per line than we received five or ten years ago.

Off hand, it may seem that this type of repair and rebuilding work wastes time and is more costly than new replacements, but a check on our layup record proves the exact opposite. Because the records indicate this policy to be a wise one, we take trouble to seek more occasions to make corrections without ordering new parts and equipment.

A good many changes may result from our experience during this war.



• How misaligned wire rope wears sheave.

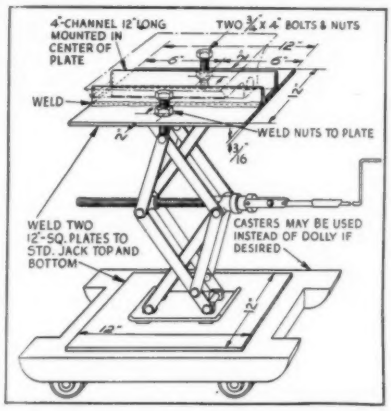
Excavating equipment may be heavier —but simpler—to operate and service, and increased emphasis will be placed on safety, but we'll not forget what we have learned about "on-the-job" service and repair.

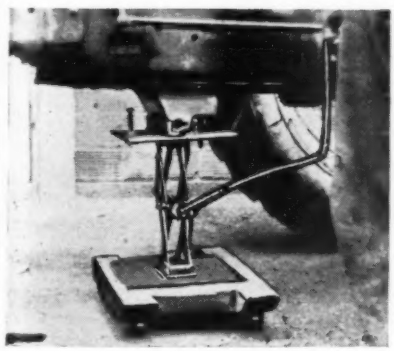
By Lloyd K. Jones
(Owner of The Jones Construction Co., Emporia, Kansas)

Tractor Parts Jack

Finding it somewhat difficult for one man to install underparts to a tractor, we have devised a special jack which is serving our purpose very adequately.

The jack was secured from a local accessory store and the adapter parts were made from scrap material which was available in the service shop.


4" CHANNEL 12" LONG MOUNTED IN CENTER OF PLATE
TWO 3/4" X 4" BOLTS & NUTS
WELD
WELD NUTS TO PLATE
13/16
WELD TWO 12"-SQ. PLATES TO STD. JACK TOP AND BOTTOM
CASTERS MAY BE USED INSTEAD OF DOLLY IF DESIRED
12"
12"



The attached photograph and drawing will provide the necessary information for those interested in the construction of such a jack.

From *Store Technics.*

Explosives

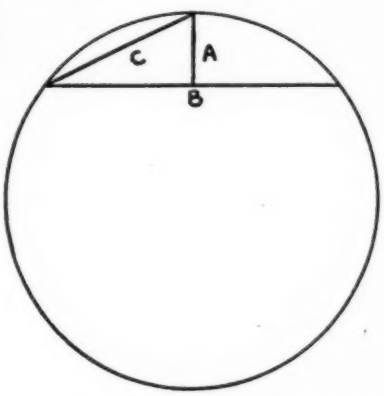
Handling and storing explosives on all projects connected with the Engineers also stress safety. The safe distance which explosives may be stored from buildings, railways, and highways are shown in the table.

A 50 per cent reduction in the distances may be applied to magazines that are screened from buildings, etc., either by natural features of the ground or by an efficient artificial barricade. The barricade must be high enough so that a line drawn from the top of the magazine to the top of the building will pass through the barricade. For safety on highways and railways, the line from the top of the magazine must pass through the barricade when it reaches a point 12 feet above the highway.

Quantity that may be had, kept or stored				Distance (feet) from nearest—		
Electric blasting caps		Dynamite				
Number over	Number not over	Pounds over	Pounds not over	Building	Railway	Highway
1,000	5,000	----------	----------	30	20	10
5,000	10,000	----------	----------	60	40	20
10,000	20,000	----------	----------	120	70	35
20,000	25,000	----------	50	145	90	45
25,000	50,000	50	100	240	140	70
50,000	100,000	100	200	360	220	110
100,000	150,000	200	300	520	310	150
150,000	200,000	300	400	640	380	190
200,000	250,000	400	500	720	430	220
250,000	300,000	500	600	800	480	240
300,000	350,000	600	700	860	520	260
350,000	400,000	700	800	920	550	280
400,000	450,000	800	900	980	590	300
450,000	500,000	900	1,000	1,020	610	310
500,000	750,000	1,000	1,500	1,060	640	320

Easy Radius Determination

In the April issue of Excavating Engineer, page 226, the following simple formula was given for determining the radius of a tunnel, from measurements taken on the inside of the tunnel.



If B is any chord, and A is the height from the center of this chord to the circumference, and C is the distance from the end of this chord to the top of A, then

$$R = \frac{C^2}{2A}$$

As far as **measuring** is concerned, it would be simpler to take a rod B of any known length (a yard-stick, for example), wedge it up against the top of the tunnel, as in the drawing, and measure A from its center (with a foot-rule, for example). Then from these two measurements alone:

$$R = \frac{B^2}{8A} + \frac{A}{2}$$

This formula is a bit more complicated, but the measuring is simpler and hence much more conducive to accuracy in the final result.

Example: Suppose a yard-stick is used for B and that A (as measured with a foot-rule) turns out to be 9 inches. Then:

$$R = \frac{36 \times 36}{8 \times 9} + \frac{9}{2}$$

$$= 18 + 4.5 = 22\tfrac{1}{2} \text{ inches.}$$

Roger Sherman Hoar

IDEAS THAT PAY

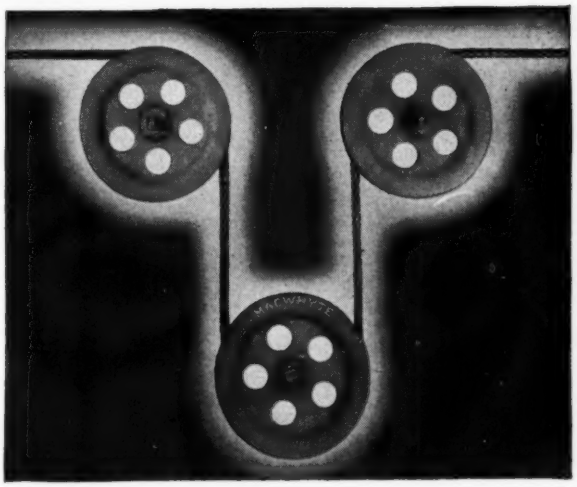
You, like others, devised "kinks" or ideas that cut costs, increased production, saved manpower, or made jobs easier. Why not share them with others and also benefit from their ideas? Let's have 'em! Just the facts will do and, if possible a rough sketch or photo. We'll be glad to send you a minimum of $5.00 for each item we publish—and, of course, give you full credit.

Send your idea to:
Field Notes Editor
EXCAVATING ENGINEER
South Milwaukee, Wis.

EX-
LAFFS
BY
J.Y. PATTERSON
"Okay, Okay, you mugs! Her telephone number is Valentine 1313."
"Boy, oh boy, are these new drill bits ever honeys!"
"Blast it, she has so! She's got on one of them low neck sun-tan suits!"
"Just think Cornish, them tracks was probably made thousands of years ago!"
"Okay, Monihan, one more of your beautiful swan dives and we go back to work!"

Recommended for these extra-tough jobs!

MACWHYTE PREformed WIRE ROPE



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Lead Lines on all types of portable excavating machinery such as:
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MINING:

Hoist, Slope, or Incline Ropes
Mining machine ropes
Non-spinning ropes for shaft sinking and shaft hoists

DRILLING:

Rotary oil well drilling lines

QUARRYING:

Derrick Main Falls
Whip Ropes
Slings

LOGGING:

Choker Ropes
Haulback Lines
Main Lines
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GENERAL:

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All 18 x 7 Kilindo Non-rotating Ropes
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Twenty years of service has proved that because it is more flexible, Macwhyte PREformed Wire Rope gives superior service on equipment requiring a great amount of bending over sheaves, particularly at high speeds. Macwhyte PREformed also stands up better under heavy loading and continuous operation.

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Shots from the FIRING LINE

Issue Report on Analysis of Tennessee Coals

Now ranking ninth among the states in the output of bituminous coal, Tennessee has produced many a ton since the day in 1814 when Allison Howard, a blacksmith, opened the state's first recorded mine in the old Kimbrough bank of Roane County to obtain fuel for shoeing the horses of a cavalry command.

A comprehensive report on analyses of Tennessee coals, released by the Bureau of Mines, said that the state's 1942 output of 7,425,000 tons was its highest on record. Production declined to 7,179,000 tons in 1943 and reached an estimated 7,350,000 tons in 1944. In 1941, the state's 146 active mines of commercial sizes produced 7,045,000 tons, valued at the mines at $16,455,000, or an average of $2.34 per ton.

Oklahoma Has Funds for ¾ First Postwar Year

Ben T. Childers, chairman of the Oklahoma State Highway Commission, recently announced that an estimated $17,650,000 in revenue for the commission in the fiscal year which started July 1 will enable the state to finance at least three-quarters of the first year of the $20,000,000 postwar federal-aid highway program.

His estimate of revenue to the commission was fixed on the $17,650,000 basis as follows: The commission's 70 per cent of the state's original 4-cent gasoline tax, $7,100,000; transfer of $5,350,000 to the commission from general fund surplus; the 1-cent gasoline tax increase for regular maintenance and construction, $2,600,000; and the additional 1-cent gasoline tax earmarked for farm-to-market roads, $2,600,000.

Seven-million dollars of this total will be required for maintenance and another $1,000,000 for equipment and other expenses, which would leave $9,650,000 for matching federal aid. The commission previously announced a $5,613,617 regular federal aid program which must be matched. Unless the revenues increase it will allow the commission to participate in only about $15,000,000 worth of postwar construction in this fiscal year.

Latin American Engineers to Get U. S. Highway Training

Twenty practicing Latin American engineers and construction men are to receive a year's special training in the United States beginning in 1946, according to a plan just announced by Charles M. Upham, engineer-director of the American Road Builders' Association. Training will consist of study and practical experience with the objective of familiarizing the trainees with American construction methods, equipment, materials and specifications, he explained.

For more than 15 years, the American Road Builders' Association through its Pan American Division, of which Jose Rivera of Mexico is secretary, has sponsored scholarships for the training of Latin American highway engineers in this country, Upham said. This training consisted of placing these engineers with state highway departments, manufacturing plants, contractors, colleges and the federal government, according to the aptitude and future plans of the individual. Today, without exception, these men are holding responsible positions in their own countries.

Now in conjunction with the Office of Inter-American Affairs, the United States Department of State, the Public Roads Administration, Pan-American Highway Confederation and other agencies, the American Road Builders' Association plans to expand and extend this training to include 20 students a year, and to accept engineers, construction superintendents, plant managers or master mechanics who can meet the requirements of education and experience, the announcement continues. Engineers must be graduates of a recognized school of engineering, have four years of practical experience, and be between 24 and 40 years of age. Others must have the equivalent of a high school education, eight year's experience and be between 28 and 40.

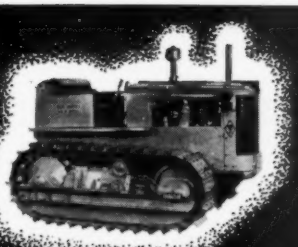
Each trainee on arrival in Washington will receive a special orientation course consisting of lectures and field trips during which time he will receive subsistence expenses from a fund set up by the American Road Builders' Association and the Office of Inter-American Affairs. This will be supplemented by eight months practical field work in highway departments or manufacturing plants, or both. Trainees will receive living expenses from their employers in lieu of wages.

Each candidate chosen will be expected to defray his own travelling expenses from his home to Washington, D. C., and also his personal expenses such as passport visas etc., while travelling to and from the United States. Each applicant is required to have $250.00 in American funds for contingencies. He must possess a working knowledge of the English language.

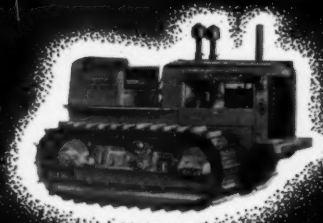
The plan, known as the Inter-American Highway Training Award, will be administered by the Inter-American Highway Training Committee. The president and engineer-director of the American Road Builders' Association will be chairman and vice-chairman of this body. It will select the candidates and their clearance will be done by the

• Iwo Jima volcanic sand bogged down so many vehicles that Marines put bulldozers to work constructing roads as soon as they landed. The armored cab on the Bucyrus - Erie Bullgrader enables the operator to continue work under Jap sniper fire.

Official U. S. Marine Corps Photo



HD-7's *and* HD-10's



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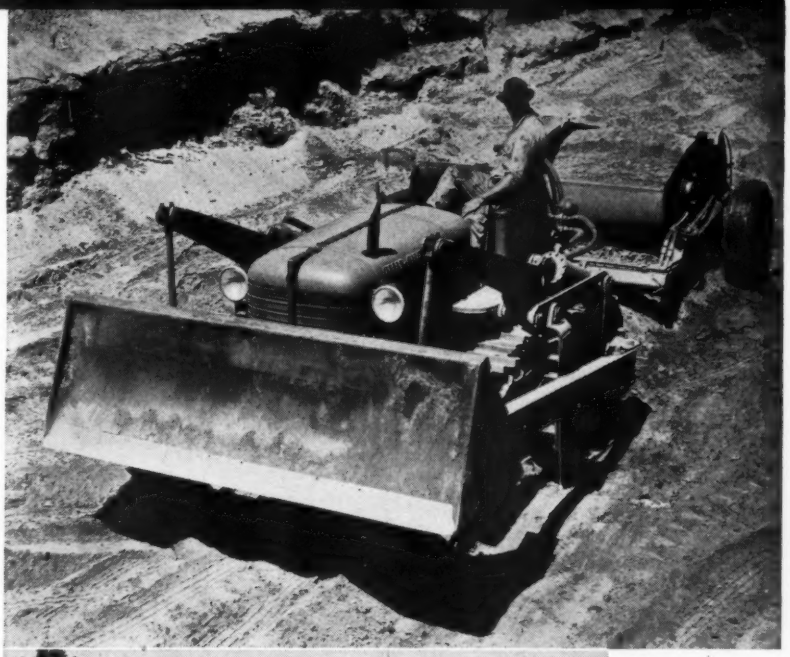

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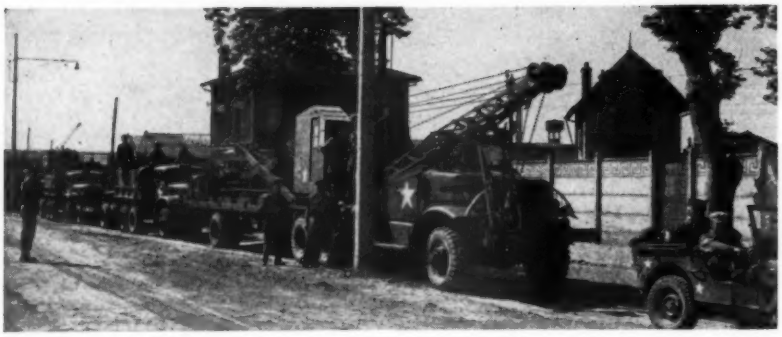


• Heavy Engineer equipment leaves depot at Villeneuve, France, headed for an assembly area, one of the steps of the long journey to the Pacific Theater.
U. S. Signal Corps Photo

State Department through its diplomatic and consular offices in the various countries.

Names of the successful candidates will be announced January 15, 1946. The selectees are expected to reach Washington early in April. Here they will have a period of lectures by authorities in their fields on all phases of highway construction, maintenance, equipment, materials, methods and transportation.

This will be followed by an extensive inspection trip starting in Washington and ending in Milwaukee. Highway departments, manufacturing plants and actual construction and maintenance projects will be visited. Details of this phase of training are being worked out.

At the conclusion of the tour, the candidate will enter upon an eight months' period of practical training and experience planned to meet his individual needs. He will be sent to state highway departments or other engineering groups for schooling in highway construction, maintenance and operation. He will be given first hand information on American methods and will gain a general knowledge of the highway industry and profession as it functions in the United States.

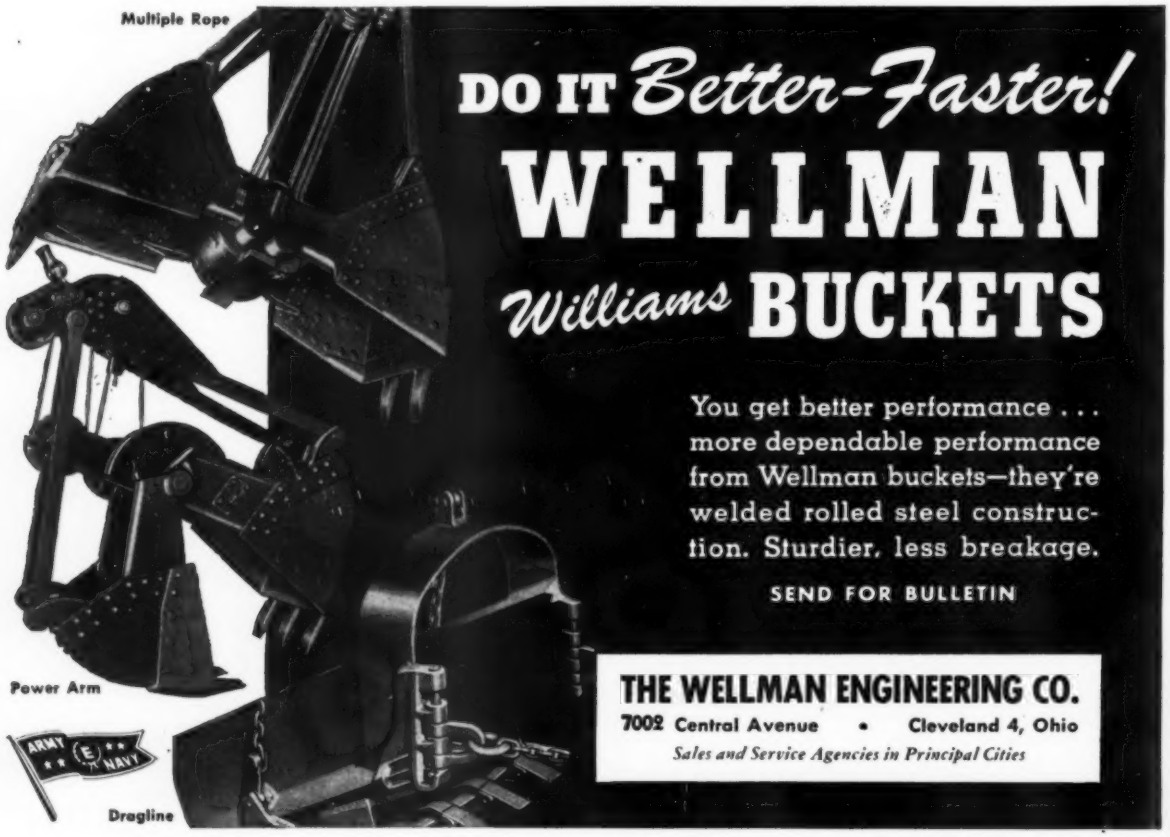
The final month will be spent in Washington, doing laboratory work with the Public Roads Administration, studying soil stabilization and the testing of materials. The final week will be devoted to general meetings, evaluation, and preparations for returning home. A short course in traffic control may be elected at this time.

Application forms will be available at American embassies or consular offices and applications to be considered must be made on them.

"The proposed training program will greatly facilitate Inter-American cooperation," declared Upham in making public this international project. "It will demonstrate the sincerity of our concern for the well-being of nationals of the other American republics, emphasize the interdependent relations between the United States and the other countries of the Western Hemisphere, foster 'the good neighbor policy', and acquaint practicing engineers of Central and South America with our modern highway design, construction, finance, maintenance, equipment, materials and operation. The value of this we have already demonstrated."

Look to Resumption of Central Valley Construction

Intensive operations locally and in the Denver and Washington offices of the Bureau looking toward early resumption of construction on the uncompleted Central Valley structures in the San Joaquin Valley were revealed by Regional Director Charles E. Carey of the Bureau of Reclamation. While construction of certain features of the



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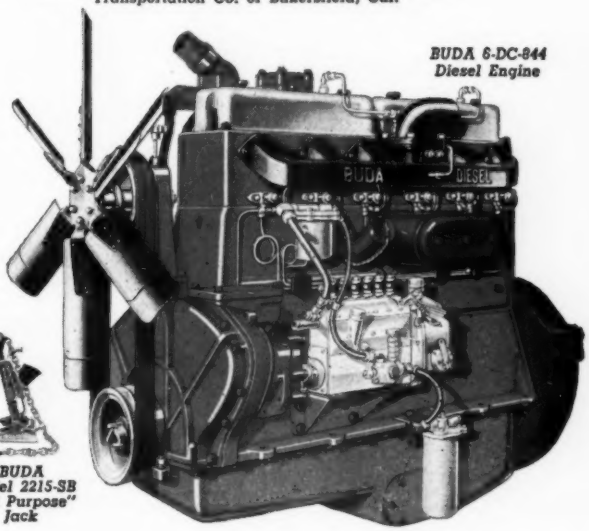

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Central Valley Project was halted early in 1942 by order of the War Production Board due to wartime shortages of manpower and materials, Carey revealed that pre-construction work on these features has continued unabated.

The Central Valley Project structures yet to be built which will bring water to the San Joaquin Valley are among the largest of those authorized to date. They are: Friant-Kern Canal, Delta-Mendota Canal, Delta Cross Channel, Delta pumping plants, and Shasta-Delta power transmission lines.

California Highway Facts

For the past few years California has led all states in the number of motor vehicles registered. Imposts on motor vehicles and other highway receipts in that state during the decade 1934 through 1943 aggregated $878,586,000, of which $97,370,000 represented Federal-aid, and $20,605,000 was appropriated from the state's general funds, a study by the National Highway Users Conference points out.

State highway construction costs during the same period were $271,962,000, maintenance $96,461,000, administration, equipment and engineering $21,845,000, collecting motor vehicle imposts cost $38,568,000, highway policing $28,828,000, debt service interest $28,966,000, principal $32,184,000, local roads and streets, $224,486,000, non-highway purposes $105,794,000, leaving unexpended at close of the period $29,492,000.

The $105,794,000 expended for non-highway purposes was partly offset by the $20,605,000 appropriated to highways from general funds.

The portion of the state's 97,705 miles of rural highways which have been improved into low- or high-type bituminous and Portland cement concrete roads, 29.16 per cent, exceeds, relatively, the 15.57 per cent national mileage likewise improved. However, as to the highways surfaced with gravel or stone, the national figure is 28.74 per cent, compared with 11.25 per cent in the state. California's use of soil as a surfacing material is indicated by the 13.82 per cent of its mileage so treated, compared with 3.44 per cent throughout the nation.

These figures are calculated from the "Highway Facts" studies being issued by the National Highway Users Conference for each state.

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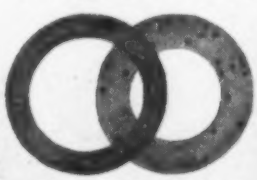

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Engineer Troops Ready for Pacific

"Engineer troops in Europe have thoroughly demonstrated their capabilities. They will need but little special training to get ready for the Pacific War," says Colonel Herman W. Schull, Chief, War Plans Division, Office of the Chief of Engineers.

Colonel Schull, just returned from an inspection of Engineer redeployment in the ETO, predicts that the rehabilitation and processing of equipment will be a far more difficult problem than training.

"Getting ready a full list of authorized equipment which can meet the rigid test of combat serviceability for each Engineer unit embarked from Europe will test the maintenance and repair and depot organizations in the theater to the full extent of their capacity," Colonel Schull said.

"What the job amounts to, in short, is taking equipment which in many instances is over two years old and has already weathered one long ocean voyage, many months of uninterrupted work, and nearly a year of service under combat conditions—take such battered equipment and put it into such beautiful shape that it can stand another long ocean voyage and still be in guaranteed A No. 1 working condition when it hits a new Pacific beachhead. It's the biggest mechanics' job in history."

The major retraining problem for the Engineer troop units, according to Colonel Schull, will be developing skilled replacements for those specialists who were converted from Engineers to infantry at the time when the need for infantry replacements in the ETO was even more pressing than the need for Engineers.

"A lot of good Engineers were combat casualties, and must now be replaced by men who know more than one

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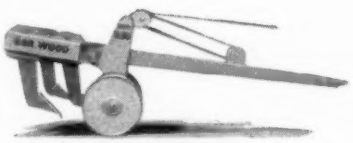
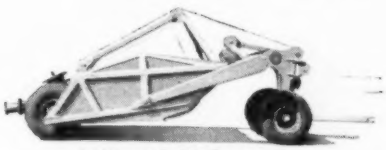
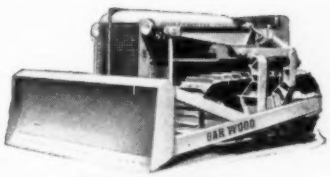


Heavy Duty Rippers



4-Wheel Cable Scrapers



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• Combined experience of 100 years in the development and utilization of the West's land and water resources are represented by these three Assistant Chief Engineers of the Bureau of Reclamation whose appointments were announced by Secretary of the Interior Harold L. Ickes. Left to right, the new assistants to Chief Engineer Walker R. Young are: Ralph Lowry, Assistant Chief Engineer, Construction; Leslie N. McClellan, Assistant Chief Engineer, Electrical and Mechanical; and William H. Nalder, Assistant Chief Engineer, Civil. The organization has been strengthened and broadened, according to Commissioner of Reclamation Harry W. Bashore, to facilitate the construction of irrigation, and multi-purpose hydraulic projects in the Bureau's expanded postwar program.

engineer specialty," says Colonel Schull.

"To provide enough equipment operators for the three-shift-schedule which was customary on engineer projects in the ETO, most Engineer General Service Regiments developed in their enlisted men skills in five or six different specialties," the Colonel points out. "If a particular job required 50 more welders than the table of organization allowed, the regiment just shifted some of its truck drivers to welding until the project was completed. An Engineer General Service Regiment overseas is like a District Engineer organization in this country. It can do anything. But this versatility isn't something which can be developed with new replacements overnight."

Holland Depending on U. S. Pumps for Land Drainage

Holland's recovery from the consequences of German-inflicted inundations depends mostly on the speed with which pumping equipment ordered in the United States can be delivered. If this equipment arrives soon enough, it is hoped that the most seriously damaged sections, Walcheren island and Wieringermeer Polder, both of which have been flooded with sea water, may be drained before the end of the year.

From a technical standpoint, the deflooding of Wieringermeer Polder will be easiest. The two breaches in the dike measure 500 yards together, and can be repaired in three months time because of the fact that the IJselmeer (Zuider Zee) has no tides to slow down repairs. The two main pumps, which fortunately are intact, will be able to drain the polder in about seven months after the reconstruction of the dike. However, if the pumps on order in

(Continued on page 442)

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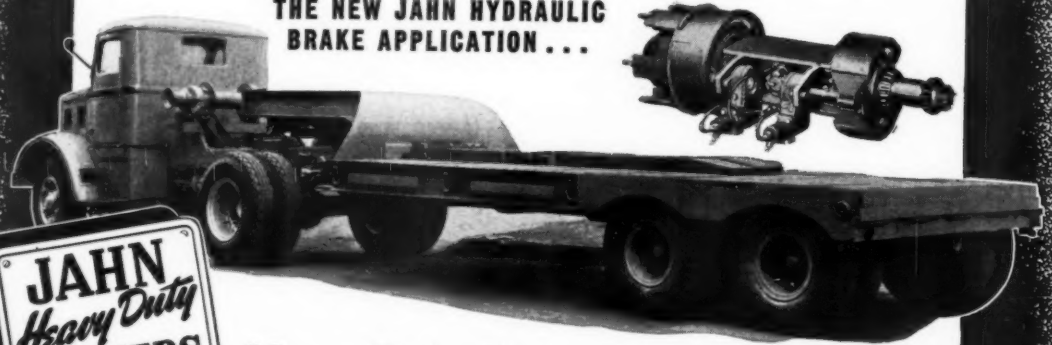

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Our leaders in Congress have responded by approving our largest highway and flood control programs and doubtless will respond with an airport program.

But, the approved programs are not being pushed to final*ization* in many states. The National Highway Program, for example, is based upon state responsibility for plans by State Highway officials and funds by State Legislatures. No citizen can afford to let this sound program go by default. If there is a lag in your theatre of operations, make it your concern. Send the coupon for "The Road Ahead", published by the American Road Builders' Association, and "Put Your Town on the Air Map", published by the Personal Aircraft Council of the Aeronautical Chamber of Commerce of America.

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D-45

Shots from the Firing Line

(Continued from page 438)

America arrive on time, the area can be pumped dry by the end of the year, making it possible to speed up the work of reconditioning the land. The brackish waters of the IJselmeer have penetrated the soil which must "split open," or buckle, by frost to make the removal of the salt possible.

On Welcheren island the problem of repairing the dikes offers far greater difficulty. Strong sea tides and storms are bound to hamper the efforts of engineers to repair the four gaping breaches, one of which is almost nine hundred yards wide. There is also a shortage of filling materials, such as twigs and stone, and of dredges. German basalt, the best type of stone for dike construction, is unavailable, so that construction officials will have to make use of the ligher Belgian basalt.

The remaining flooded sections, running northward from Rotterdam across the thickly populated provinces of South- and North-Holland, have been inundated with fresh water, and consequently are far easier to drain. However, no crops are expected from this area, covering some 250,000 acres of arable land, during the present year.

Coal Shipments Subject to Producer Ceiling Prices

All shipments of bituminous coal from a mine or preparation plant, regardless of method of delivery or class of buyer, are subject to the ceiling prices established for producers, the Office of Price Administration announced.

This change, effective July 16, 1945, requires a revision in ceiling prices by some sellers who have taken the higher dealer ceilings on certain shipments from the mine or preparation plant, such as on truck shipments to nearby domestic buyers.

To avoid a rollback in prices of these sellers to levels that would cause hardship to them, and possibly interfere with the orderly distribution of bituminous coal, OPA will receive applications for adjusted ceilings on truck-shipped coal under certain conditions.

Such applications can be filed when a producer finds that his ceilings for truck-shipped coal are lower than his October 1941 prices to the same class of customer, plus any ceiling price increase granted his mine since that time.

This action will also facilitate enforcement of the producer price ceilings by making it clear that all shipments from the mine or preparation plant are subject to the producer ceilings.

The action was approved by the Office of Economic Stabilization and was taken after consultation with the industry and with the Solid Fuels Administration for War.

Anti-diversion Legislation In Various States

Efforts to curb the diversion of highway-user tax receipts to unrelated purposes made further progress in a number of significant instances during state legislative sessions throughout the country this year.

Anti-diversion state constitutional amendments are scheduled to be voted on next year by the electorates of Maryland, Pennsylvania and Texas, as the result of legislative action this year. The Pennsylvania and Maryland proposals would restrict the use of automotive tax funds to highway and related purposes, while the Texas amendment would permit the use of one-fourth of such revenues for school purposes and limit the remainder to highways.

A proposed state constitutional amendment to outlaw highway fund diversion in Kentucky will be voted upon this November, under authority granted by the 1944 Kentucky Legislature.

Such amendments have previously been adopted in 16 states—California, Colorado, Idaho, Iowa, Kansas, Maine, Michigan, Minnesota, Missouri, Nevada, New Hampshire, North Dakota, Oregon, South Dakota, Washington and West Virginia.

Initial approval was given anti-diversion amendments this year by the legislatures of Indiana and Tennessee, but in both states approval by the next succeeding legislatures also must be given before submission to the voters.

In the most notable current-year instance of an attempt to curb diversion

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by legislation rather than constitutional amendment, Wisconsin's legislature passed over Gov. Walter S. Goodland's veto a bill providing for the segregation of highway-used tax revenues in a single trust fund to be used for highway purposes. Governor Goodland had opposed the principle of special dedicated funds, and had contended segregation of highway revenues would lead to new general taxes in years to come. Segregation of automotive tax revenues had been recommended by a state legislative interim committee on highways, however, as necessary to assure adequate funds to finance postwar highway construction.

An anti-diversion amendment proposed in Illinois was amended before final passage to provide only a resolution in opposition to diversion.

Connecticut's legislature this year failed to approve for submission to the voters an anti-diversion amendment which had been given initial approval by the 1943 Connecticut House of Representatives.

Anti-diversion amendments were unsuccessfully proposed in a number of other states this year, including Delaware, New Jersey, Rhode Island and Utah.

A bill providing for reorganization of the Georgia State Highway Department and seeking to prevent highway fund diversion was withdrawn from the 1945 Georgia Legislature by its sponsor for revision preparatory to presentation at a meeting of the Georgia legislature expected to be called in January, 1946.

Although rejecting an anti-diversion amendment, the Utah legislature did pass a bill to restrict the use of motor vehicle registration funds to highway purposes. This bill was vetoed by Gov. Herbert B. Maw, however, with bitter controversy resulting over the question of whether his action would result in Utah losing a portion of its postwar federal-aid road grants.

The possibility that penalties in federal aid road funds might be made in the case of states diverting highway funds to unrelated purposes was also raised in Oklahoma and some other states. Provision for such penalties is in the original Hadyn-Cartwright law of 1934 and is carried over in the road construction law enacted by Congress last year. The legislation permits a penalty up to a third of the total federal aid.

To just what extent the federal government may attempt to impose such penalties in the future has not yet been indicated. If stringently applied, the penalties would confront a number of states with the alternatives of revising their tax structures or losing a portion of their postwar federal highway aid allotments.

Appoint Powers and Snider to Mo. Road Commission

In a reorganizational move to prepare the Missouri State Highway Commission for its $90,000,000 postwar road building program, Gov. Phil M. Donnelly appointed John J. Powers of St. Louis and William A. Snider of Albany to serve on the commission.

The new appointees succeed William C. Connett, vice president of the First National Bank of St. Louis and George H. Davis of Kansas City, chairman of the commission, who resigned.

Miss. River Commission Opens Bids Privately

"On account of War Conditions, the Department has instituted a uniform procedure in making awards, for all types of contracts, and has adopted the system of opening offers privately instead of publicly," Brig. Gen. M. C. Tyler, president of the Mississippi River Commission, stated.

"The Contracting Officer is obliged to negotiate with the offerers, so as to obtain the best terms for the government. The lowest offerer is naturally in a favorable position, but all offers are considered. After the award has been made, and not before, interested parties may be informed as to the names of the offerers and the final offer made by each. This information is also available to trade publications," he said.

The reasons for this procedure, according to Brig. Gen. Tyler, are that war conditions make normal peacetime methods impracticable. Conditions of labor, materials, and priorities are un-

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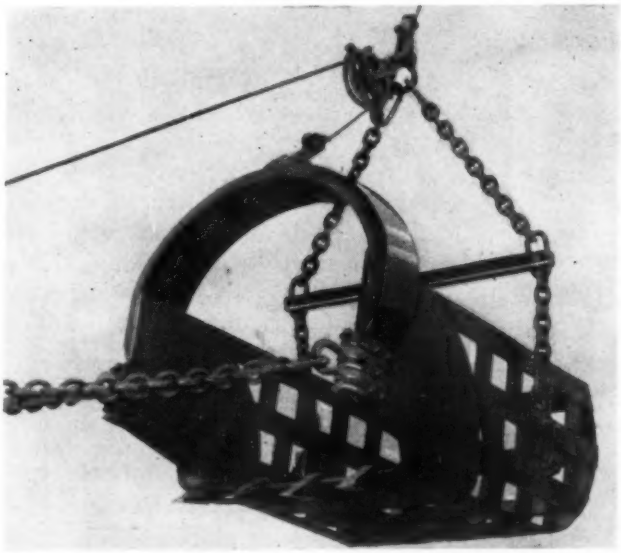

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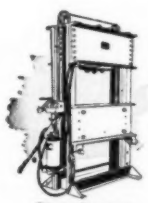

Shop Presses

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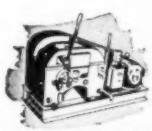

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• **Before this haul trail was completed on Guadalcanal by an Allis-Chalmers HD-14 tractor and Baker 'dozer, supplies had to be carried to the fighting lines on the shoulders of badly needed fighting Marines.** *Signal Corps Photo*

certain, and it is necessary to be sure that the contractor who receives the award is actually able to do the work on time and up to the required standards at a reasonable price.

"The Department believes this changed procedure to be necessary in meeting war conditions and hopes contractors and bidders will accept the situation in the interest of the war effort," he said.

Louisiana Has Plans for $350,000,000 Road Program

Plans for a $350,000,000 highway expansion program in Louisiana were disclosed by Gov. James H. Davis and State Director of Highways D. Y. Smith.

Governor Davis, in a report to the State Legislature revealed that such an over-all plan has been formulated by the highway department in collaboration with the Federal Bureau of Roads, but conceded that the "stupendous" undertaking could not be attained in full for at least 10 years.

Giving a partial breakdown of the plan, Smith said it embraces expansion along the following lines: New multi-lane concrete highways, $118,659,000; new two-lane concrete highways, $95,907,000; widened multi-lane concrete highways, $57,030,000; widened two-lane concrete highways, $34,290,000; new two-lane asphalt highways, $43,010,000; resurfaced two-lane asphalt highways, $7,340,000; resurfaced gravel highways, $13,772,000; repaired bridges, $13,772,000.

Governor Davis could account for a maximum of only $57,000,000 of the funds needed for the program and this included both state and federal funds. The remainder would presumably come from revenue sources not yet outlined, such as an additional sales tax.

Total road mileage now under state maintenance in Louisiana is 14,474.88, according to Smith. Citing the rapidity with which the Louisiana highway department's responsibilities have grown, Smith pointed out that in 1924 only 2,723 miles of state roads were maintained by the department.

Name Hockensmith to WPB Construction Post

Appointment of George L. Hockensmith as deputy director of the War Production Board's Construction Bureau was announced by John L. Haynes, bureau director. Hockensmith, formerly chairman of the Construction Requirements Committee, succeeds Alexander Milne, Jr., who has resigned to return to his contracting business in Plainfield, N. J. Raemey A. Burton, former deputy chairman of the Construction Requirements Committee, has been appointed chairman, Haynes said.

Mr. Hockensmith became chairman of the Construction Requirements Committee in December, 1944. He holds an engineering degree from the University of Maryland, and was engaged in foundation construction work in various parts of the country before entering Government service in December, 1941. His home is in Washington, D. C.

Mr. Burton has served as deputy chairman of the Construction Requirements Committee since February 1945, and has been with the Construction Bureau (formerly the Facilities Bureau) since the fall of 1942. His home is in Washington, D. C.

Survey Reveals $15 Billion In Postwar Construction

Thomas S. Holden, president of F. W. Dodge Corporation, reported today that his organization's field staff by the end of May had spotted 99,638 specific construction projects contemplated for postwar execution in the 37 states east of the Rocy Mountains. The combined value of all projects is $15,746,202,000. Holden emphasized that the listings included specific projects only, and do not include announcements of general construction or expansion programs.

The Dodge executive declared that the information was obtained in continuous surveys from more than a million individuals, companies, institutions, and government agencies, and represents the cumulative and unduplicated reports of his field staff over a three-year period. While 99,638 projects are listed, the number of buildings involved is much greater, for many projects involve more than one structure, Holden said.

Analysis of the individual project re-

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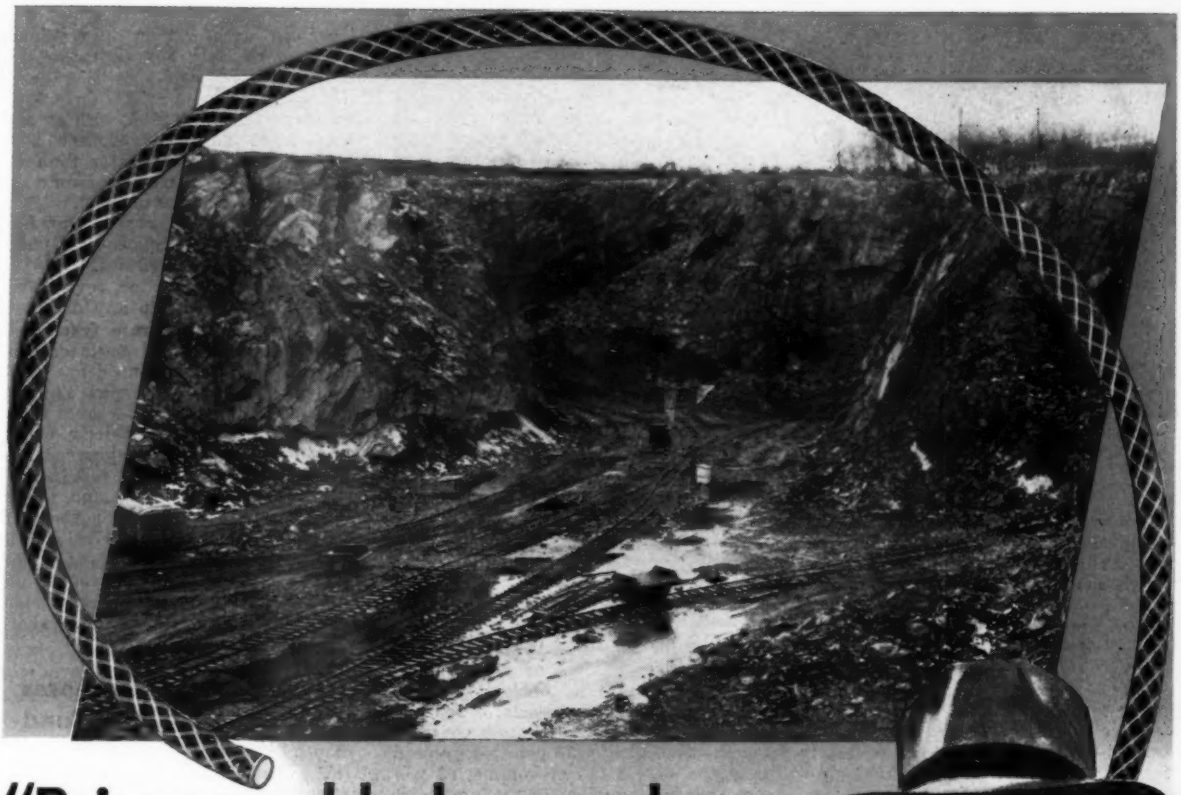

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• Rock for fill on the Sand Hill area of Adak Island, Alaska is loaded by a Bucyrus-Erie 5-cu. yd. shovel. *U. S. Navy Photo*

ports shows, Holden said, that 33,104 jobs, estimated to cost $7,753,138,000, have progressed to the design stage. It is these projects, he said, which will be advanced toward execution as rapidly as government regulations, and supplies of materials and manpower permit.

The remaining 66,534 projects, with an estimated cost of $7,993,064,000, constitute a backlog of specific contemplated projects, many of which will progress to design stage as rapidly as architects and engineers can find enough draftsmen to expand their currently limited planning activity, the Dodge executive declared.

"Full significance of these figures on contemplated construction projects is realized by comparing them with the contract records of peacetime years," Holden said.

"The dollar volume of design-stage work, exclusive of the backlog of additional contemplated projects, is 143 per cent greater than the 37-state contract volume for 1938, is 118 per cent greater than the 1939 contract volume, 93 per cent greater than the 1940 volume, and 14 per cent greater than the maximum peacetime contract volume established in 1928," Holden said.

Privately owned projects in the design stage number 22,795, with an estimated total value of $2,609,675,000. This is considerably greater than the volume of private construction contracts awarded in 1938, 1939 or 1940.

The Dodge file of postwar projects contains a preponderance of public projects, Holden pointed out.

"Delays in construction revival will definitely not be due to any dearth of plans. If only a moderate fraction of the public building and engineer projects that have been planned are ready to go ahead within the next 12 to 18 months, these, added to the great reservoir of planned private projects, urgent small projects as yet unplanned, and deferred maintenance and repairs, will constitute as large a demand as the industry can take care of in the transition period. The real revival bottlenecks are government regulations, material and manpower shortages, and confused price trends, with the added potentiality of transportation shortages," Holden said.

South Carolina Increases Road Maintenance Fund

South Carolina's State Highway Commission voted to increase the state highway maintenance appropriation from $2,000,000 to $2,500,000, and authorized an appropriation of $500,000 for new equipment. The commission voted to proceed immediately with the surfacing of approximately 150 miles of roads throughout the state.

New Laws Affecting County Highway Financing

Ala.—H. 64 amends law providing for state aid in construction of county roads to provide that with the start of the post-war federal-aid highway program and for three years thereafter the State Highway Department must set aside monthly for the use of each county 167th of one cent of the state's gasoline tax. Any amount unused to the credit of each county will be held by the State Highway Department for matching purposes during or before the close of the next fiscal year; appropriates to the Highway Department the sum of $2,500,000 to be held in reserve to be used, 167th in each county on farm-to-market roads without matching by the counties, but to be matched with a like sum of federal-aid money in each county when moneys appropriated by Federal-aid Highway Act of 1944 and allocated to Alabama for secondary roads are available.

Ark.—SJR 5 (Raney) constitutional amendment that maximum county road tax that may be levied with approval of majority of voters in county, would be 10 mills instead of three mills.

Ark.—S. 46 (Milum) authorizes payment of part of valid outstanding funding bonds issued by counties for building bridges; Highway Commission to

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ascertain from county clerks proper amounts to be paid.

Ark.—S. 266 appropriates for counties from "County Aid Fund" $2,355,504 for each of next two fiscal years from County Highway Fund, Municipal Turnback Fund, and other funds.

Ark.—S. 304 (Dillon) amends provision requiring state treasurer to deduct from counties' turnback allotments sufficient to pay (1) 75 per cent of maturing bonds issued by road improvement districts after February 4, 1927, and (2) 50 per cent of maturing bonds and interest of road districts created after 1931, to provide for payment of such bonds from any surplus over the amount so deducted.

Dela.—S. 212 appropriates funds to purchase past due interest coupons on certain highway improvement bonds and state aid bonds issued by New Castle, Kent, and Sussex Counties during fiscal biennium ending June 30, 1947.

Dela.—S. 213 (Yerkes) authorizes state treasurer to purchase highway improvement bonds and state aid bonds issued by New Castle, Kent, and Sussex Counties during fiscal biennium ending June 30, 1947.

Ill.—H. 19 (Kelsey) requires only 25 legal voters on petition for an annual tax of not to exceed 33⅓c of each $100 assessed valuation for construction of hard-surfaced roads or improvement of earth roads.

Ill.—H. 328 (Hunter) defines state-aid roads as all highways designated by county boards and approved by Department of Public Works and Buildings.

Ill.—S. 232 (Oldfield) creates commission to investigate present use of dirt roads and farm-to-market roads.

Ind.—H. 370 confers on State Highway Commission power to cooperate with federal and other units of government for post-war highway projects.

Ind.—H. 430 requires all gasoline and motor vehicle funds to be specifically appropriated; provides method of appropriating funds to counties for highway purposes.

Iowa—H. 212 fixes annual allocation of road funds for biennium beginning July 1, 1945, at $1,000,000 for secondary road program and $4,600,000 for primary roads.

Kans.—SCR 14 directs legislative council to make study and report relative county and township roads.

Kans.—S. 35 (Nelson) provides tax levy not exceeding one mill to create special road and bridge fund in counties operating under county road unit system.

Kans.—S. 147 designates a secondary road system which includes farm-to-market roads, rural mail routes, and school bus routes, construction and maintenance of which are placed under jurisdiction of Board of County Commissioners of each county. In selection of the mileage to be designated in each county for inclusion in the secondary system consideration must be given to inclusion of principal county and township roads so located as to provide adequate inter-town and inter-county connections to best serve the rural population of the state.

Md.—S. 386 (Marvel) provides for acceptance, application, and administration of federal funds to be allotted to state for benefit of state highway system, street and highway system of Baltimore City, secondary road system of counties, and street and highway system of other political subdivisions.

Mich.—H. 148 (Aiker) provides for county planning and creation, organization, powers, and duties of county planning commissions.

Minn.—H. 370 (Powers) apportions $25,000 from gas tax to reimburse Trunk Highway Fund for cost of maintaining a County Highway Division in Department of Highways.

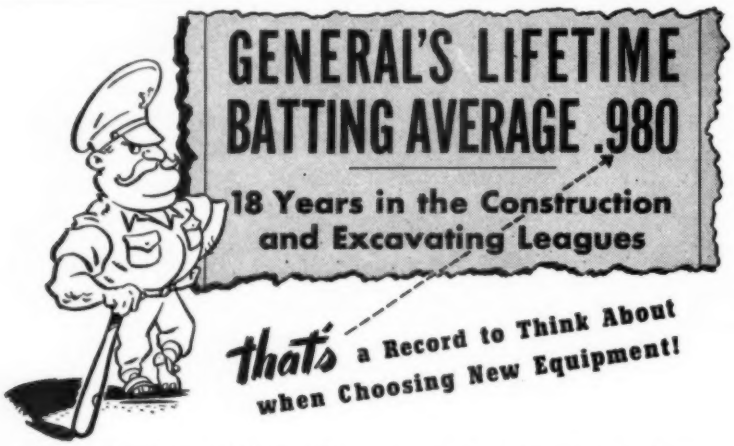
Minn.—H. 532 authorizes the county board of any county to use 25 per cent of its share of gas tax proceeds to pay bonds issued for road and bridge purposes, including bonds issued for matching federal aid under the provisions of the Federal-aid Highway Act of 1944.

Minn.—S. 984 authorizes county planning commissions to improve areas outside of second class cities.

Minn.—S. 754 (Dennison) authorizes county boards to appropriate funds to aid in construction and maintenance of municipal streets and bridges.

Mont.—H. 129 creates road fund in counties for use in post-war period.

Nebr.—Bill 234 (Carmody) provides one mill levy by counties for raising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• A crane swings a loading net full of ammunition away from a landing craft to the beach on Lingayan Gulf, Luzon, P. I. Cranes are used for unloading landing craft that cannot get close enough to shore.

U. S. Signal Corps Photo

funds to cooperate with federal government in construction and improvement of county roads.

Nev.—H. 213 authorizes State Department of Highways to construct and maintain system of secondary roads.

Nev.—S. 2 (Haight) authorizes establishment of post-war reserve funds by counties and municipalities to be used for public improvements.

N. Mex.—S. 86 (Pacheco) provides for county use of state machinery where such facilities are not otherwise in use, and where county facilities are inadequate.

N. Dak.—HCR D (Haugen) requires Commissioner of Public Roads to establish engineering standards to make it possible for counties to participate in grant of federal funds for construction of farm-to-market roads.

N. Dak.—S. 205 increases from 6,000 to 10,000 the number of miles State Highway Commissioner may designate as secondary highway system on which secondary or feeder road funds may be expended.

Okla.—H. 139 (Parrish) apportions to each school district levying and using not more than 10 mills tax, the revenues accruing to such county and apportioned from motor vehicle license fees.

Okla.—S. 199 declares the policy that soil is a natural resource and directs the State Highway Commission and the Boards of County Commissioners to rejoin, regrade, construct or reconstruct all highways if necessary for the purpose of saving and conserving the soil and preventing floods; cost of proposed program to be in maintenance cost of highway system so far as is practicable, plus what amounts, if any, may be added or contributed by federal agencies.

Okla.—S. 226 appropriates funds and revenues accruing in state highway construction and maintenance fund to pay expenses of maintaining and operating Department of Highways in construction and maintenance of state highways, secondary or feeder roads and to pay outstanding obligations.

Ore.—H. 270 (Heisler) provides for establishment of sinking funds by counties for county roads.

Ore.—H. 394 provides for uniform signs along streets and special road districts and establishment of county roads.

Pa.—H. 632 (Mahaney) authorizes County Commissioners to grant rights-of-way and licenses for rights-of-way for roads, pipelines, etc., on and across land bought by counties at tax sales.

Pa.—H. 724 (McClester) requires State Highway Department to take over in third class cities all bridges and highways which are maintained by city or county.

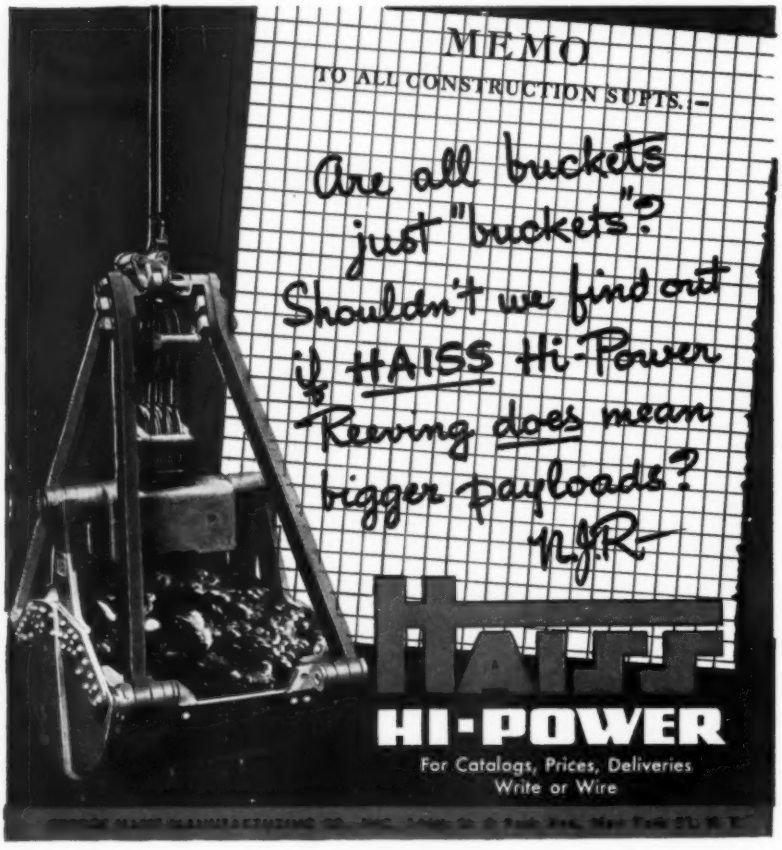
Pa.—S. 404 (Snowden) provides that counties' share of liquid fuel taxes must be maintained in separate fund and expended only upon approval by Highway Department; permits counties with approval of Highway Department to contract for work on basis of anticipated receipts.

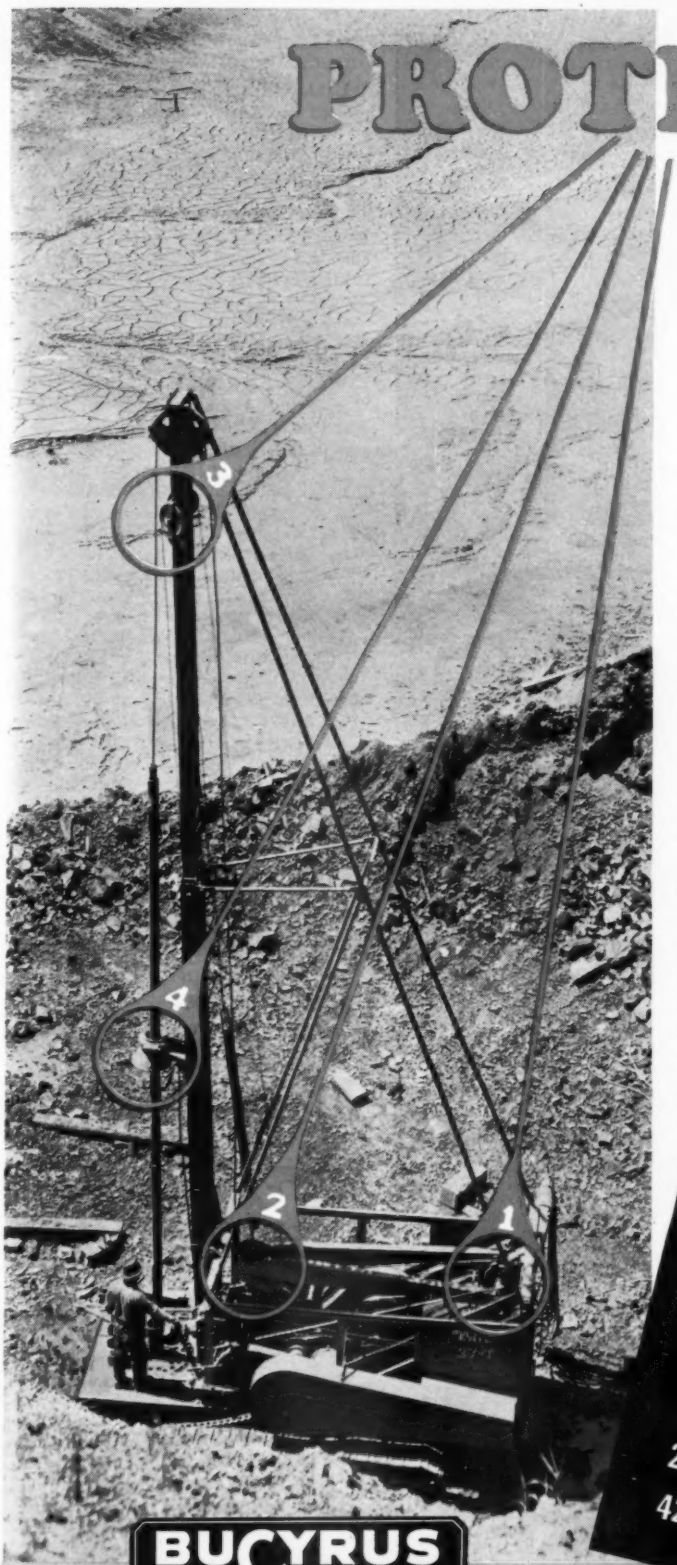
S. Dak.—H. 90 empowers State Highway Commission to cooperate with Public Roads Administration in construction of secondary or feeder roads.

S. Dak.—H. 112 authorizes counties to assist municipalities in building and maintenance of public streets and alleys within certain municipalities.

S. Dak.—S. 177 (Terry) makes necessary concurrence of Public Roads Administration in location, form, character of informational, regulatory, and warning signs, traffic signals on streets or roads constructed with federal aid.

Tenn.—S. 396 requires consent of county highway departments for State





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• Paver at work on the highway between Rio de Janeiro and Petropolis.

Highway Department to administer County Road and Bridge Fund.

Tenn.—H. 750 (Maysilles) requires state and county auditors to audit books and records of all county highway commissions.

Utah—H. 166 (Freer) permits counties to use Class B road funds for construction and maintenance of Class A roads through cooperative agreement with Road Commission; permits cities and towns to use Class C funds for curb and gutter improvements on Class A roads within municipal limits, also through agreement with Road Commission.

Wash.—H. 208 (Miller) authorizes state and political subdivisions to accept federal loans, advances, and grants in aid or donations.

Wash.—S. 317 (Bargreen) provides that from moneys in Motor Vehicle Fund distributed to counties, $3,000 per month shall be deducted and turned over to Highway Department for supervisor's expenses; provides that after April 1, 1946, 10 per cent of county's share shall be divided equally, 70 per cent on basis of county highways used by school buses and rural mail routes, and 20 per cent on the number of licensed motor vehicles in the county.

Wash.—S. 320 (Todd) amends mine-to-market law to permit expenditure of funds in improvement of public trails; appropriates $300,000 from Motor Vehicle Fund to special Mine-to-market Road Fund, 75 per cent to be taken from state's share of Motor Vehicle Fund and 25 per cent from counties' share.

W. Va.—H. 42 extends extra 1c gas

ANNOUNCING - -

For The First Time In The West—
A New Service

We are now in production with HOLLOW DRILL STEEL for Timken — Ingersoll-Rand and Conventional Rods.

Fast service on General Repair, all Hollow Drill Shanks and Thread.

In production and repair paving breaker tools.

Welding Department —

In production Oxy-acetylene and Electric Welding for built-up Manganese Work, Bucket Teeth, Ditcher Teeth, Rod Tipping, etc.

STEEL CONVERSION CORP.
LAS VEGAS, NEVADA

Built Up To A Standard, Not Down To A Price

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

A Time-Saving **ACCESSORY**

Bulldog ROPE SOCKETS never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in dozen sizes and four different styles.

T34C

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

tax for secondary road purposes until July 1, 1947.

W. Va.—S. 61 provides in making expenditures for maintenance of secondary roads, State Road Commission shall distribute available funds justly among several counties in such manner as will best serve interests of the state and convenience of its inhabitants; provides any money previously advanced to any county for payment of rights-of-way and which has not been repaid to the State Road Commission, shall be a charge against and deducted from any funds allocated to such county.

Wyo.—S. 17 (Stirling) requires that road work shall be commenced promptly in counties upon request of Boards of County Commissioners.

National Lime Association Safety Competition, 1944

Employees and officials at nine of the 44 lime plants enrolled in the National Lime Association Safety Competition for 1944 achieved the outstanding safety records of operating throughout the year without any lost-time accidents according to the Bureau of Mines, United States Department of the Interior.

Men at these nine operations worked 1,120,468 man-hours or 14 per cent of the slightly more than eight million man-hours worked in the 44 competing plants. On the basis of greatest exposure to industrial hazard, the Genoa plant of the United States Gypsum Company at Genoa, Ohio with 346,448 man-hours was declared the winner. Although this plant has had low accident rates each year since it was first enrolled in the competitions in 1939, its 1944 record was the first without any lost-time injuries. In accordance with the rules of the contest, "Certificates of Honor" will be awarded to the nine accident-free plants which are listed in order of hours of exposure to hazard:

Genoa plant, United States Gypsum Company, Genoa, Ottawa County, Ohio; 346,448 man-hours.

York plant, National Gypsum Company, York, York County, Pennsylvania; 275,131 man-hours.

Martinsburg plant, North American Cement Corporation, Martinsburg, Berkeley County, West Virginia; 187,920 man-hours.

Asbury plant, The Standard Lime and Stone Company, Knoxville, Knox County, Tennessee; 110,999 man-hours.

Thomasville plant, The J. E. Baker Company, Thomasville, York County, Pennsylvania; 89,318 man-hours.

Thornton plant, Marblehead Lime Company, Thornton, Cook County, Illinois; 35,773 man-hours.

Houston plant, Nyotex Chemicals, Inc., Houston, Harris County, Texas; 26,013 man-hours.

Falls Village plant, United States Gypsum Company, Falls Village, Litchfield County, Connecticut; 25,154 man-hours.

Salem plant, Salem Lime and Stone Company, Salem, Washington County, Indiana; 23,712 man-hours.

The over-all accident record of the 44 enrolled plants showed some adverse effects from the cumulative strains of three straight years of effort to meet the taxing demands of the war. Although the accident-frequency rate of 38.513 in 1944 was lower than in 1943 and 1942, it was the third highest annual rate in the history of the contests and was appreciably higher than the average for the past decade. The severity rate of 5.527 in 1944 was higher than in any other year since the inauguration of the contests in 1935 except in 1940. This relatively unsatisfactory showing probably resulted from such wartime handicaps as loss of skilled workers to the armed forces, high rates of labor turnover, the longer work-day, and the difficulties in securing repair parts and replacements for badly-worn equipment.

Machinery for Veterans Employment Set Up

Officials of the Associated Equipment Distributors (AED) have already swung into the task of effectuating a policy agreed upon at the recently concluded semi-annual directors meeting of that body in Chicago relative to employment of returning veterans in the construction and road building machinery industry by setting up a nation-

"HERCULES" (Red-Strand) Wire Rope

Hercules of mythology has lived through the ages because of his ability to do the big jobs. His super-human strength and endurance made this possible–

"HERCULES" (Red-Strand) Wire Rope is also a "doer." Its qualifications, too, are the same. It not only has the strength to handle the big loads, but—and this is of *great* importance in wire rope usage—it also has the stamina and endurance to stand up under bending stresses and other gruelling conditions encountered in present day work.

For *consistent* top-flight performance you can rely on this modern "HERCULES". It is available in both Round Strand and Flattened Strand constructions, in either the Preformed or Non-Preformed type.

The selection of the correct grade, size and type of wire rope . . . proper installation and equipment . . . consistent maintenance procedures—all will contribute to longer rope life. Our Engineering Department is also "At Your Service" with respect to any wire rope problem which you may have.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
WIRE ROPE MAKERS — ESTABLISHED 1857
5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U.S.A.

NEW YORK • • • 90 West Street
CHICAGO • • 810 W. Washington Blvd.
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SEATTLE • • 3410 First Avenue South

• The British Army, which operates its own railway training centers, is able to construct and maintain its own railways, and operate them if necessary. Here, soldiers with the aid of a Caterpillar diesel tractor, are moving trees to make a cut for a new railway.

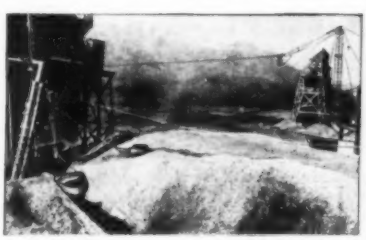
wide program aimed, according to H. O. Penn, of New York, AED president, "at providing new and constructive opportunities for returning veterans in every section of the country, as the nation's largest program of road and highway construction and all post-war construction requiring the use of heavy machinery and equipment gets into momentum."

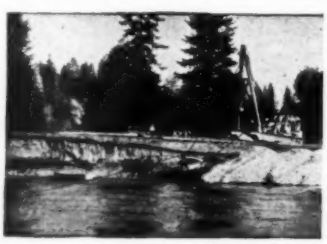
At the Chicago meeting President Penn praised the "clear thinking and wise planning" of the Surplus Property Board, and President Truman for transferring disposal of billions of dollars in surplus consumer goods from the Treasury Department to the Department of Commerce "where this activity rightfully belongs." If officials concerned with surplus war property disposal follow the recommendations of the Baruch report and confine distribution of war surpluses to industry channels "as far as is practically possible and feasible," Penn told directors and committee members of AED, "they will have taken the most effective and practical step toward eliminating speculators and preventing exploitation of billions of dollars invested by the taxpayers in war supplies and equipment by potential postwar millionaires, who in the past were never identified with these products in planning, investment, labor or sale."

The AED program for employment of discharged veterans calls for setting up state representatives of AED, one in each state working within the geographical pattern of AED's 14 regional units and in conjunction with the organization's Committee on Employment of Discharged Veterans, of which A. F. Garlinghouse, of Los Angeles, is chairman.

This committee is preparing an extensive list of categories of jobs or possible jobs in the construction machinery industry. Each state representative assigned by AED to the employment of discharged veterans program will cooperate with U. S. Veterans Employment Service and other official government representatives concerned with this problem, in an effort to place veterans in positions fitting their physical and mental capacities.

CUT COST OF DIG-AND-HAUL JOBS





(View at Left) Sauerman Slackline Cableway in distance is digging sand and gravel from river while small Sauerman Scrapers in foreground handle stockpiles at central mixing plant, on large concrete dam project. (View at Right) Sauerman Scraper machine, with skid-mounted hoist, moves along bank of river, building a sloping revetment with gravel it drags from bars in midstream.

A sure way to economize on many long range material-handling jobs is to use a Sauerman Scraper or Cableway. You can reach across a pit, pond, river or stockpile or up to the top of a hill, move material from any point within the radius of the operating cables and dump the material automatically wherever desired along the line of operation.

Sauerman machines are the product of more than 35 years of specialized experience in designing this type of equipment. Whether your problem is the handling of a few cubic yards or many thousand cubic yards per day, we can give you a size and type of machine economically suited to your requirements—a long-lasting, dependable unit, operated by one man. Sauerman engineers will be glad to study your material-handling problems and offer suggestions.

SAUERMAN BROS. INC., 574 S. Clinton St., Chicago 7, Ill.

SAUERMAN
Long Range Machines

Recommend Modernization of Massachusetts Roads

Modernization of Massachusetts highways through a six-year, $153,000,000 program, to be financed by highway fund receipts from the state gasoline tax, was recommended to the Massachusetts Legislature by a special recess commission on postwar highways.

Besides the vast highway construction program contemplated on a statewide basis, the commission called for completion of plans for a new north-south arterial highway through Boston, from the Charles river dam to Albany St., near Dover St.

The $153,000,000 program which the commission proposed for the first six years after the war calls for the expenditure of $90,000,000 for state high-

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How to make Better Time...

CABLE trouble can play the devil with construction schedules. That's why wire rope performance is one of the most important factors in determining dirt-moving profits. The better the cable, the more efficient becomes your equipment . . . the faster your job moves along.

TIGER BRAND Excellay Preformed Wire Rope doesn't have to be broken in. You can put it to work at once. Its *preformed* construction gives it *greater* fatigue resistance. You get top production because each strand bears its full share of the load. This superior cable runs true in sheave grooves, spools evenly at all speeds under light or heavy loads.

Important, too, is TIGER BRAND's safety advantage. Crown wires lie flat and in place even when broken . . . do not stick out to tear hands and clothes of your men.

Prepare now to use U·S·S American TIGER BRAND Excellay Preformed Wire Rope on your next job. Specify it for new equipment . . . re-rig your old equipment with it.

Excellay Preformed

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York
UNITED STATES STEEL

USS STEEL
UNITED STATES STEEL

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

• U. S. Army railroad unit will soon have this railroad line in operation again by using the Bucyrus-Erie crane to place the form for concrete to replace the missing arch from this railroad bridge near St. Lo, France.

U. S. Signal Corps Photo

ways; $30,000,000 to fill in gaps in the state highway system in cities and towns; $3,000,000 for the Metropolitan District highways and $30,000,000 for Chapter 90 work—a plan under which state, county and municipality participate in highway costs.

Giving much study to the Boston traffic problem, the commission declared: "Boston must chisel a great artery through a maze of narrow, winding city streets, flanked with towering and costly office buildings, industrial establishments, banks, residential blocks and never-ending cross streets converging from every conceivable direction."

The commission recommended that its proposed new Boston north-south arterial highway should be an elevated structure, a depressed highway, an expressway at street grade, or a suitable combination of all three.

As a means of stimulating highway construction by municipalities, the commission called on the state to allocate $5,000,000 a year to cities and towns, distributed in proportion to actual local appropriations and expenditures for local highway purposes during the last 10 prewar years.

To match federal funds for highway improvements, a $7,500,000 annual state appropriation for the next six years was recommended.

Advising that land-taking proceedings should be undertaken at once to permit postwar projects to get under way with the least possible delay, the commission warned: "If rights of way have not been previously obtained, there will be serious delays, particularly where buildings are to be removed."

State Senator Harris S. Richardson of Winchester was chairman of the recess commission which submitted the report.

Domestic Production of Corundum Increases

Virtually at a standstill since the close of the first World War, the domestic production of corundum, an aluminum oxide abrasive used for grinding and polishing metals and glass in military and other equipment, gradually is increasing, Dr. R. R. Sayers, Director of the Bureau of Mines, disclosed in releasing a comprehensive Bureau report on the properties, sources, prices, mining, and milling of corundum.

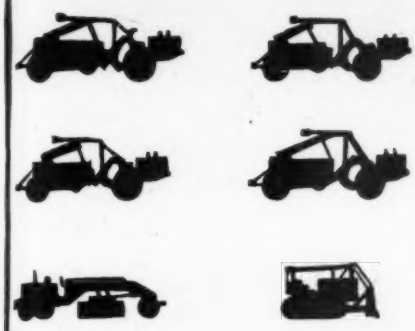
As a result of an intensive research program fostered by the Bureau of Mines and the Geological Survey of the Department of the Interior, and the War Production Board, development of corundum deposits in Georgia, North Carolina, and Montana, has been revived and possible new sources of commercial supply have been explored in other States, Dr. Sayers said. Some of these deposits have not been worked in more than 25 years.

Since 1921, when American industry turned from Canadian sources to the Union of South Africa, the Transvaal deposits have supplied nearly all the corundum used in the United States. Until comparatively recently, industrial statistics showed no marketed production in this country after 1918. Current reports on domestic production

(Continued on pafe 462)

What are you paying for "SEAT-FAG"
If your power shovels, graders, bulldozers, clamshells, cranes, etc., are equipped with hard iron seats you are unquestionably paying a good price for "Seat Fag", in terms of work-loss and reduced efficiency.
Milsco Cushion Seats are a dividend-paying investment . . . through the conservation of energy and human efficiency for useful work. These seats are supplied complete, with the heavily padded, comfortable cushion. Seats may be fitted with a variety of attachments for practically any standard type of mounting.
Write for your copy of FILE FOLDER 44-A, which contains detailed information.
MILSCO MANUFACTURING CO.
2758-G N. 33rd Street, Milwaukee 10, Wisconsin
No. 123
Crusader with back rest and removable cushion.
No. 813
Bucket Type Cushion Seat with Back Rest.
Milsco
MILWAUKEE
Cushion Seats
FOR FARM AND INDUSTRIAL EQUIPMENT

TOURNAPULL FLEET



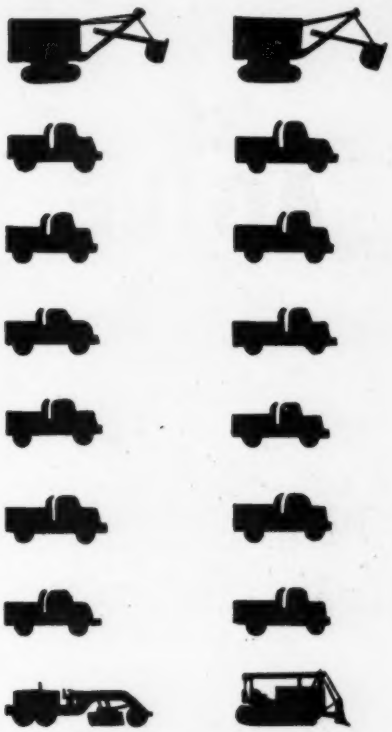
4 15-yard Tournapulls
1 113 hp snatch-tractor with dozer
1 motor patrol

6-man operating crew
788 operating horsepower
188,400 lbs. equipment

ONLY 38½% OF SHOVEL AND TRUCK EQUIPMENT INVESTMENT

Charts show equipment required to move 350 pay yards per hour on half-mile one-way haul in common.

SHOVEL & TRUCK FLEET



2 1¾-yard shovels
12 7½-ton (6-yd.) trucks
1 75 hp tractor-dozer on dump
1 motor patrol

18-man operating crew
2250 operating horsepower
459,000 lbs. equipment

OVER 2½ TIMES TOURNAPULL FLEET EQUIPMENT INVESTMENT

they go through where trucks can't go, operate in wet weather when trucks shut down.

INVESTIGATE TOURNAPULL CLAIMS

Before you buy any additional dirtmoving equipment, be sure to check your job estimates against Tournapull costs. Your LeTourneau distributor will be glad to give you every assistance in setting up these figures and showing you how to check and prove them to your own satisfaction. Investigate Tournapull lowest-net-cost-per-yard claims NOW. It's vitally important to your planing and profits.

Tournapulls haul over pavement without interrupting traffic. Leonard & Slate have 8 Tournapulls on this Portland to Seattle Route 99 realignment job where they are moving 600,000 yards of earth and rock, with hauls to one-half mile over existing pavement.

C28

LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

JOB-PROVED
Over 3400 Built and Shipped

TOURNAPULLS*

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STREAMLINE OF WELDING ELECTRODES

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AGILE BLUE for general purpose, all-position AC welding of mild steel.

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AGILE BLACK for AC or DC welding of cast iron.

AGILE YELLOW a non-ferrous (copper nickel alloy) electrode for welding cast iron without preheat. AC or DC. Weld deposit is machineable.

AGILE BRONZE for DC welding of copper, brass, bronze, other copper alloys and cast iron.

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Shots from the Firing Line

(Continued from page 458)

since the resumption of operations are confidential.

The hardest mineral known except for the diamond, corundum in powdered form makes possible the smooth and scratch-free surfaces essential to the accurate performance of optical lenses and other parts of such precision instruments as range finders, gunsights, searchlight mirrors, field glasses, periscopes, torpedo-tube sights, and cameras. Coarser grades are made into grinding wheels for processing iron and steel products—shells, lathe and boring tools, cutters, gear differentials, carburetors, surgical instruments, and hundreds of other items needed in industry and war.

Widely distributed throughout the world, corundum has been found in at least 20 different rock types and 35 different countries. Many of the deposits are of only mineralogical significance, however, and the principal countries possessing deposits of commercial importance are the United States, Canada, Union of South Africa, India, Madagascar, and Russia.

Texas Has $60,000,000 Road Construction Program

A $60,000,000 postwar construction and maintenance program for 7,205 miles of farm-to-market roads which will not require counties to furnish any funds has been announced by the Texas Highway Department.

Half of the funds will be from current operating income of the Highway Department, while the Federal government will match the state's portion. The program is for three years immediately following end of the war.

Approval of the plan to aid Texas' agricultural interests means that the state will surface and maintain 5,830 miles of farm road. Presently, counties are having to pay upkeep on these roads. Also, the new program includes maintenance of an additional 1,375 miles of surfaced farm roads which the state previously constructed and now maintains.

"By transferring this tremendous financial burden from the county governments to the state government, counties will be able to concentrate their local funds on roads remaining under county control," the Commission said. "This should enable counties to make tremendous strides in improving other farm roads."

The Commission said that while the present program includes a relatively small portion of the total mileage of farm-to-market roads in the state, the plan is the maximum for which the state could obligate itself for three years immediately after the war on the basis of estimated receipts.

If, after the three-year period, more funds are received from state sources and the Federal government, it is possible that additional feeder or farm-to-market roads may be taken over by the state and new ones constructed, the Commission explained.

• While a Bucyrus-Erie 27-T blast hole drill prepares for the shooting of a new face, a Bucyrus-Erie 5-cu. yd. electric shovel loads out the previous shot in the California Portland Cement Co. quarry near Colton, Calif.

Though small in comparison with the total farm-to-market road mileage in Texas, the Commission pointed out that the 7,205 miles assumed in the new program will benefit the most dense agricultural areas.

Selection of these 7,205 miles was made after detailed study and research of the entire 170,000 miles of county roads in the state.

Of the 170,000 miles, only approximately 26,000 have a traffic load of 100 motor vehicles a day. This number is the necessary minimum, research has determined to justify surfacing a road, based upon retiring the cost of construction and maintenance over a 15-year period.

By its action, the Texas Commission has assumed obligation of 29 per cent of the 26,000 miles of the principal farm roads. Surveys also have determined that after a road is surfaced the traffic count on it practically doubles.

How agricultural interests and others will benefit from the expanded farm-to-market road program is shown by research by Commission engineers. According to accurate records kept on average automobiles which traveled more than 3,000,000 miles, the operating cost per vehicle on dirt roads was 7.8

Designed for Tough Rock Digging. Heavy welded box boom. Boom-foot shock absorber takes out lateral twisting strains. Larger shipper-shaft sprocket gets more push into crowd action. Chain drive tightened by power. Three-foot boom point sheaves go easy on hoist cables. Straight, simple shipper shaft comes out easily. No boom weakness below shipper shaft because shipper shaft is set into upper edge of boom, not through center.

These base machine advantages, too, add up to better rock performance: Separate crawler frames provide the flexibility needed for tough digging. Adjustable hook rollers make possible the fine adjustment that eliminates tipping. Power clutch, set by 15-pound pull, retains "feel" of load. Straight splined shafting, not weakened by shoulders and keyways, adds digging strength.

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ASK FOR YOUR 605 CATALOG *Today.....*

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PLEASE SEND NEW 605 EXCAVATOR CATALOG TO:

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STREET ADDRESS

CITY AND ZONE STATE

KOEHRING HEAVY DUTY

ARMY E NAVY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

• Bulldozer clears streets of the Walled City of Manila, Luzon, P. I., just after American troops passed through.
U. S. Signal Corps Photo

cents per mile. On paved road the cost was 3.8 cents per mile.

For these days of gasoline rationing, the research project also proved that the average automobile gets two miles less per gallon of gasoline on unpaved road than on paved road.

Illinois Road Improvement

A bill appropriating $15,000,000 for improvement of township roads was given final passage by the Illinois Legislature.

Blast-Furnace Slag in 1944

Output of commercialized blast-furnace slag in 1944, totaled 12,405,992 short tons, 25 per cent less than the 16,507,607 tons reported in 1943. Sales of air-cooled slag declined 24 per cent, and the average value per ton of screen increased one cent, whereas unscreened was one cent lower than in 1943. These statistics are based on a canvass, conducted by the National Slag Association, of the 32 companies that prepare blast-furnace slag for commercial use. The results of this canvass were assembled in co-operation with the Bureau of Mines, United States Department of the Interior.

Texas Electorate to Vote on Tax Diversion

A proposed state constitutional amendment giving automotive tax receipts partial protection against diversion to unrelated purposes was approved by the Texas Legislature just prior to the adjournment of its 1945 session and will be referred to the electorate at the 1946 general election.

Under the proposal, three-fourths of all net revenue derived from the collection of motor registration fees and all taxes on motor fuels, except gross production and ad valorem, shall be used for the sole purpose of acquiring rights-of-way, constructing, maintaining and policing public roadways, and for the administration of laws, and, additionally for the payment of the principal and interest on county and district road bonds or warrants voted or issued prior to Jan. 2, 1939, and declared eligible prior to Jan. 2, 1945, that have been made payable out of the county and road district bond assumption fund.

It would be expressly provided that the net revenue derived by counties from registration fees shall never be less than the maximum amounts now allowed to them nor the percentage counties are allowed to retain under laws in effect Jan. 1, 1945, reduced.

The other fourth of the automotive tax revenue would be guaranteed to the available school fund.

Advocate Gas Tax Raise In Connecticut

A one-cent increase in Connecticut's gasoline tax rate to aid in financing a proposed $225,000,000 postwar highway construction and development program was advocated by State Highway Commissioner William J. Cox at a hearing conducted by the Connecticut Legislature's finance committee.

Asserting that many of the state's most used roads and highways are "utterly inadequate" to handle traffic, Commissioner Cox said that to give the state a modern system of roads will require about 15 years of work and will cost an estimated $15,000,000 a year.

"We are not asking that the state pay more for roads," he said, "but only that the state adopt a sound pay-as-you-go program for future improvement."

Col. Michael A. Connor, former state motor vehicles commissioner and member of the State Highway Advisory Committee, said the main need for the one-cent gasoline tax increase is to enable the state to match anticipated federal grants for road development. At present, with the highway fund depleted and income greatly reduced, no monies are available for this purpose, he said.

ROGERS GIRDER TYPE

the BETTER trailer for your BIGGER hauling jobs

THIS trailer, designed by Rogers Brothers to meet low headroom conditions, has been used for some time in certain sections of the country. Now, because of the larger equipment in use, it is coming into extensive use elsewhere.

ROGERS BROTHERS CORP. ALBION, PENNA.

EXPERIENCE builds ROGERS PERFORMANCE sells

Electricity

Models range from 350 to 35,000 watts, A. C. types from 115 to 660 volts, 50, 60, 180 cycles, single or three-phase and 400, 500 and 800 cycles, single phase. D. C. types from 6 to 4000 volts. Also available in dual voltage and special frequency types.

Onan ELECTRIC PLANTS

For Excavating and Contracting Work

Onan Electric Generating Plants supply reliable, economical electrical service for excavating and contracting uses as well as for scores of other general applications.

Driven by Onan-built, 4-cycle gasoline engines, these power units are of single-unit, compact design and sturdy construction. Suitable for mobile, stationary or emergency service.

Model shown is from W2C series; 200 to 3500 watts; powered by Onan-built, two cylinder, water-cooled engine.

D. W. ONAN AND SONS
3292 Royalston Ave.
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Write For Folder 690-A describing complete Onan Line

Shunk
GRADER AND SCARIFIER BLADES

For any type or make of machine—Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls, Snow Plows. Also—

CUTTING EDGES, WEARING BOOTS, BACK SLOPERS, EXTENSION BLADES, MOLDBOARDS and SCARIFIER TEETH

50 years of specializing in the manufacture of Construction Equipment Blades has developed for your benefit a quality of special steel, milled through our own rolls and forged at the edges to give that extra cutting and wearing quality you need.

Furnished in various widths, lengths, and thicknesses, punched ready to fit your machine.

Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.

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MANUFACTURING COMPANY
Established 1854
BUCYRUS, OHIO

AROUND THE WORLD
You'll see
BLAW-KNOX BUCKETS

doing more work with less crane time on every kind of job that requires a bucket—from dredging in Florida to removing rubble in devastated, war-torn cities. The chief reason for the world-wide popularity of Blaw-Knox Buckets is that the line is *complete.* You can specify—and get—exactly the right bucket for the job in question.

Over 100 types and sizes of BLAW-KNOX BUCKETS are described in our illustrated Catalog No. 1757 . . . send for your copy today.

MAKE 'EM LAST
Bulletin 2004 gives complete instructions on the care and maintenance of Clamshell Buckets . . . A copy on request.

BLAW-KNOX DIVISION
of Blaw-Knox Company
2074 FARMERS BANK BLDG., PITTSBURGH 22, PA.
NEW YORK • CHICAGO • PHILADELPHIA • BIRMINGHAM • WASHINGTON
Representatives in Principal Cities

Where There's a Will

(Continued from page 423)

hoisted up in one piece. The ¾-cu. yd. machine, rigged as a crane, has ample stability to use the 60-foot boom required on this work.

The weight of a complete rib is only 300 pounds, but each is so ungainly that its erection has been a real problem on many an advance base job. Men have been injured trying to guide the ribs in place with their hands while the pieces were being hoisted with other tackle.

Here, the Seabees merely hook on to a rib with the crane, hoist it up, and while the base is being fastened to the anchored leveling plate in the concrete floor, other men space the top and bolt it in place to the transverse beams. In order for the top crew to work 35 feet off the ground in perfect safety, a rolling dolly, or jumbo, was built and mounted on four rubber-tired wheels off a welding machine. This is only a working platform built on 4"x4" timber legs and braced with two-inch lumber, but it puts the men up where the work is without making them climb around over a dangerous skeleton framework. The ribs go up so fast, using this system, that the carpenters who nail temporary lagging on the ribs to brace them are hard pressed to keep up.

The Bucyrus-Erie crane was used a little earlier in the job to dig all the deep drains and water lines that lead through the vicinity. It was rigged as a dragshovel and it accounted for 3900 feet of six-foot trench in three weeks. Seabees have demonstrated the versatility of small machines of this type, under one and one-half cu. yd. capacity, again and again. They have used them as cranes, dragshovels, draglines, shovels and piledrivers, changing the rigging in a few hours. Most of the machines like this one have done a variety of work and have the marks of several campaigns on their cabs.

Seabee Spoor

(Continued from page 426)

the pictures. Use the pictures as a yardstick with which to measure the war.

These illustrations show just a few of the scars left by only one Seabee Battalion working for only one year!

There was nothing on the site of the airfield shown but rolling desert covered with kiave brush and a few private homes when the Seabees arrived, 25 months before the picture was taken.

When you survey the scene from the rise of ground near the control tower today, the whole landscape in front of you is covered with pavement — gray, smooth and level. It stretches from the horizon at your left to the horizon at your right.

Yet this long panoramic picture shows only the right half of the main strip. Besides this main one, there is another strip, at an angle, out of the picture to the left with the rest of the main one. You are therefore looking at about one-third of the pavement on the field.

The Seabees laid 1,056,000 square yards of asphaltic concrete on the runways and main parking areas alone, not counting the auxiliary roads and areas between buildings. In one seven and one-half-month period they used 68,711 tons of asphalt.

There was a cinder cone seven miles away across the island. The battalion engineers made tests, and found that when mixed with the red volcanic earth of the region, the cinders could be bladed, sheepsfooted and rolled to make excellent subgrade, capable of withstanding the specified wheel loadings.

There was a Chinese cemetery on the slope of the cone. (The Chinese believe it particularly seemly to bury the dead among ashes.) They moved the cemetery.

One year later they had not only used up the entire cone, but had dug an enormous hole in the ground 140 feet deep and 250 yards across where the cone had stood!

The marks of the teeth of a power shovel still show on the walls of this Seabee-dug canyon. The overhangs resulted when the operator abandoned unusable material that had solidified into clinker.

The two pictures were taken from opposite ends of an imaginary line. The sailor in whites who serves as a yard-stick in most of the pictures is standing on the points where the camera was placed—on the brim for one shot, and at the bottom-most point for the other.

Asphaltic concrete takes plenty of crushed stone. Although the quarry shown in another picture was started by island contractors years ago, the Seabees greatly enlarged it.

Ideal aggregate was made from this volcanic rock, which is even-textured, impervious, heavy and hard. About 81,640 cu. yds. was taken out of the quarry in the seven and one-half month-period.

Four sizes were graded and mixed by the crusher, which was built by the contractor in another decade and operated by the Seabees for the entire 25 months.

In the same picture smoke can be seen in the distance, marking the site of the asphalt plant. It was a straight haul from quarry to plant to airstrip. Five miles away on the horizon the trees and buildings beyond the strip can be dimly distinguished.

The commander of the battalion fretted about the empty asphalt drums. He felt it was a shame that they could not be salvaged in some way.

Some day the great mound of barrels will have rusted down into a heap of redness, but in the meantime it stands as an expressive monument to the productivity of America.

Tomorrow great planes of peace will soar from the airfield. As they rise into the Pacific sky passengers will smile and say, "It's a mighty big ocean, isn't it?"

They will gaze idly at the overgrown cinder pit — the weathered quarry — the green mound under which the asphalt drums' dust lies. Will they know what those scars represent? Will they remember the men, the tractors, the trucks, the sweat, the tears?

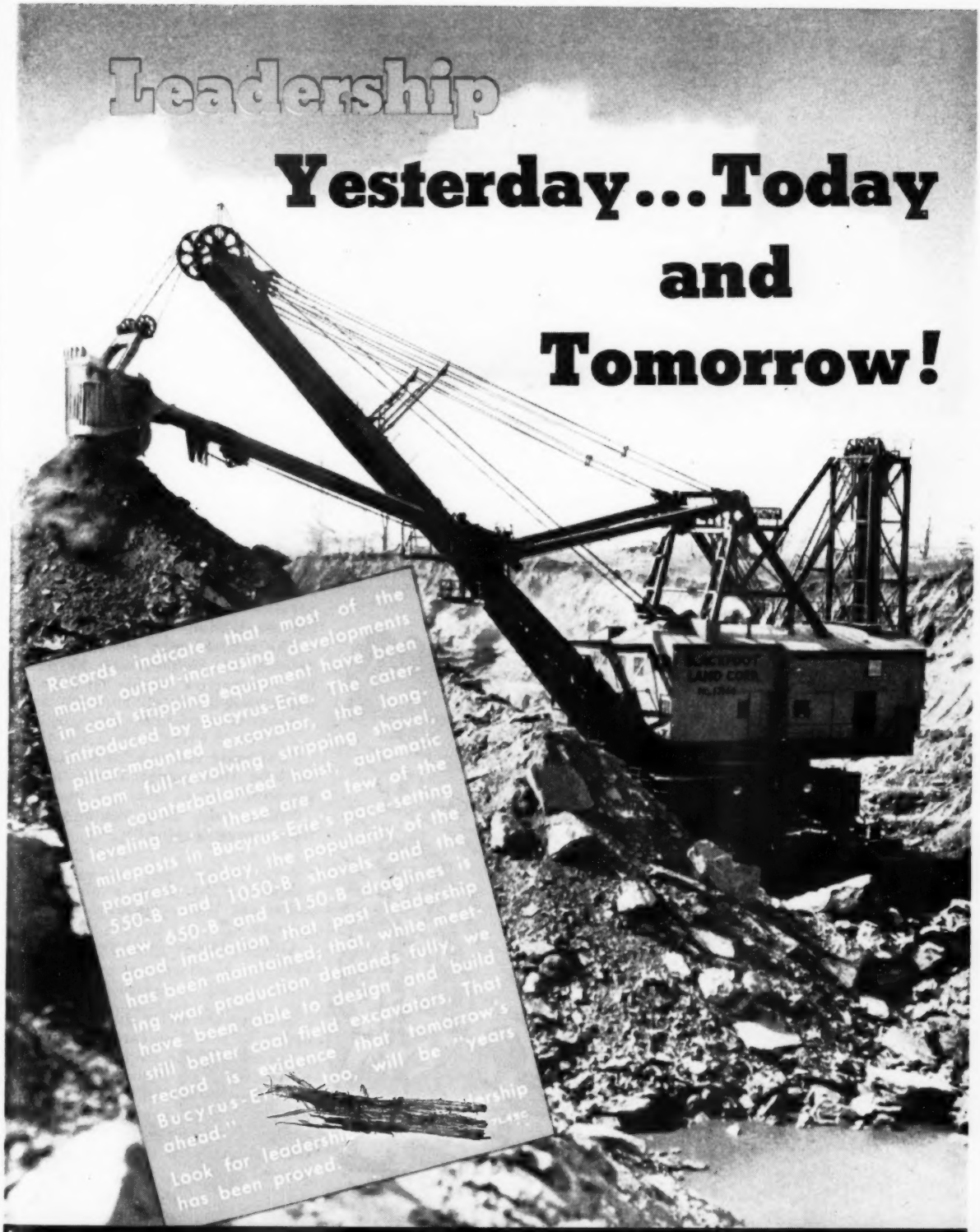
Will they have a true conception of the size of the war they fought in the 1940s?

Engineers Salvage Shovels

One of the biggest single salvaging jobs undertaken by the Corps of Engineers was the repair of five Bucyrus-Erie 120-B 5-cu. yd. electric shovels with dragline combinations. These five shovels had been used in important construction on the Panama Canal and had become badly worn through heavy use and exposure to the tropical climate.

Their work done in Panama, these shovels were needed elsewhere. Thirty-seven flat cars were required to transport the five shovels from the West coast to the Missouri River Division Engineer Repair Shop at Kearney, Nebraska.

Special concrete aprons were poured to provide outdoor work areas for the repair of the machines which were too large to be taken inside the shop. Special drying ovens were also required to handle the electrical motors and parts. All bronze bushings and other parts not readily available were made in the Engineer Repair Shop. At the end of 120 days four of the shovels were rebuilt and the fifth was sold to an American coal mining company. Three of the rebuilt shovels were shipped to the Pacific for quarry work and one to Australia.


Leadership
Yesterday...Today and Tomorrow!
Records indicate that most of the major output-increasing developments in coal stripping equipment have been introduced by Bucyrus-Erie. The caterpillar-mounted excavator, the long boom full-revolving stripping shovel, the counterbalanced hoist automatic leveling ... these are a few of the mileposts in Bucyrus-Erie's pace-setting progress. Today, the popularity of the 550-B and 1050-B shovels and the new 650-B and 1150-B draglines is good indication that past leadership has been maintained; that, while meeting war production demands fully, we have been able to design and build still better coal field excavators. That record is evidence that tomorrow's Bucyrus-E... too, will be "years ahead."
Look for leaders... has been proved.
BUCYRUS-ERIE
SOUTH MILWAUKEE, WISCONSIN

NOT in the *Contract*

A Red Cross worker on a remote Pacific island called up the Army command and said, "We have a case of beri-beri here. What shall we do with it?"

"Oh, give it to the Seabees. They'll drink anything."

When a pretty girl got on the crowded bus, a pale-looking fellow started to get up. But she pushed him back in the seat and said she preferred to stand. Again he tried to get up and again she pushed him back. Finally he yelled, "Now, listen, lady! I passed my stop two blocks back—let me out!"

"Lady, if you want a health examination, you'll have to remove your blouse."

"Oh, my goodness, no, Doctor."

"Come, come, don't make mountains out of mole hills."

"Would you live with a stranger if he paid you $100,000?" the lawyer asked the pretty defendant.

"Yes."

"Would you live with him if he paid you only $25?"

"Certainly not! What do you think I am?"

"We've already established what you are," came back the lawyer. "Now we are trying to establish to what extent."

Most popular want ad of the day: "Soldier with two years overseas service wants to correspond with widow who has 2 or 3 children. Object, 85 points."

"I'm sorry," said the elevator girl. "Did I stop too quickly?"

"Oh, no," was the sweet reply from one of the feminine passengers. "I always wear my pants down around my ankles."

"Look Fellows, Carnigh's got on one of them camouflage suits!"

The man was determined to pass the tavern on the way home without stopping in. As he approached the place, his resolve weakened, but finally with a masterful effort he passed on. Then after going a full block he stopped and congratulated himself: "Well done, old boy. Now come back to the tavern and I'll treat you to a snort!"

Embarrassed young man: "er-ah-sir-I-er that is—I came to say that your daughter tells me that she-er loves me."

Parent: "Oh! And you have come to ask my permission to marry her?"

Embarrassed young man: "No, sir; I came to ask you to make her behave."

Largest shoe carried by the Army is size 15½ EEE. Soldiers with larger feet than this are equipped with caterpillar treads.

A meddling old woman accused one of the contractor's workmen of having reverted to drink because "with her own eyes," she had seen his wheelbarrow standing outside the tavern.

The accused man made no verbal defense, but that evening he placed his wheelbarrow outside her door and left it there all night.

"I suppose you've been in the Navy so long that you're accustomed to sea legs."

"Why lady, how could you? I wasn't even looking."

Medic: "Pvt. Jones swallowed the knife, sir. We've operated but can't recover it."

Officer: "Okay, issue Jones another knife."

A Navy recruit on guard had strict orders to admit no car unless it bore a special tag. He stopped one whose passenger was a high-ranking officer.

The guard heard the brass-hat order his driver to go through, and calmly said: "I'm sorry, sir, but I'm new at this. Who do I shoot, you or the driver?"

She reached below her dimpled knee
Into her rolled-down stocking,
And there she found a roll of bills:
Ah, me; 'twas sweetly shocking!
"Why don't you keep it in a bank?"
Inquired a nosey prier,
"The principal is the same," she said,
"But the interest here is higher."

Maumee Mines

(Continued from page 421)

operations. However, it wasn't long before it was found that this method of maintaining a level in the pit was impractical because shale and fire clay became mixed with this coal and the pit was covered with these piles of coal dug out by the shovel. And, too, often the shovel mired down in soft fire clay when moving over an area where it had removed the coal to keep the established level.

A more practical method of dealing with the problem of the rolling coal vein was adopted and is still followed. The shovel follows the top of the coal vein as much as possible in digging out the overburden, but where a deep dip is encountered the stripper works past this area and then turns and digs out the dip behind it as much as possible without cutting into the coal seam. Often an Allis-Chalmers HD-10 tractor equipped with a Baker bulldozer that cleans up in the pit near the stripper is used to doze out remaining shale above the coal in the deepest dips, or gulleys.

Although 750,000 cu. yds. of overburden is the monthly average at Mine No. 27, this figure has been run up as high as a million cu. yds. a month.

Both the dragline and the stripper are oiled every eight-hour shift and controls are greased every 24 hours.

Dipper teeth on the shovel are changed about every week and the worn teeth are built up at the company's shop and faced with manganese steel. Dragline buckets are also hard-faced.

Electricity to run the stripping equipment is brought to the mine from Edwardsport, Indiana, about 20 miles away, at 33,000 volts a.c. and is reduced to 4160 volts and changed to d.c. current on the machines.

A Marion 490 electric shovel with a 3½-cu. yd. dipper loads out the coal in 48 ft. cuts and average production of this loader is about 2500 tons per eight-hour day. Maximum production of the loading shovel is 2800 tons a day.

• Hauling units make an average of 25 2½-mile round trips an eight-hour day from the loading shovel to the dump hopper. Coal loaded from the hopper to railroad cars on this conveyor is hauled to a tipple and preparation plant five miles south of Linton.

Hauling Units

Six hauling units are used at Maumee's No. 27 mine, three Darts with 25-ton Austin-Western trailers and three Autocars with 20-ton Austin-Western trailers. Each of the hauling units makes an average of 25 2½-mile round trips an eight-hour day, six days a week for 12 months a year. The units use a circular hauling route, coming up to the loading shovel from one direction and continuing on to the dump hopper past the shovel after being loaded. Up until about the middle of June, box cuts were being loaded out and the hauling units had to make U-turns in the cuts, get loaded and return over the same route they came in on when empty.

Pit trucks use an average of 35 gallons of gasoline a shift under dry conditions. Both the Darts and Autocars are refueled twice a day and are lubricated every shift at night.

The haul roads in Maumee's No. 27 mine are 45 ft. wide with an average grade of 1½ per cent and a maximum grade of two per cent. All of the three miles of haul road at the mine is made of an 18-inch shale base covered with four to five inches of crushed limestone hauled from Spencer, Indiana. The roads are crowned in the center and there are drainage ditches on both sides. A road drag and sprinkler truck are kept busy the entire shift each day and a bulldozer is used to maintain the pit road.

SUPER-PERFORMANCE
Like that of the B-29, Owen superiority is based upon a thorough knowledge of the problem, expert designing and precision manufacturing from the most appropriate materials available.
The OWEN BUCKET Co.
6095 Breakwater Avenue, Cleveland, Ohio
Branches: New York Philadelphia Chicago Berkeley, Cal.
OWEN BUCKETS
A MOUTHFUL AT EVERY BITE

Notes from the manufacturers

Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich., announces the appointment of E. F. Bentley as contractors' equipment sales manager.

Cleveland Pneumatic Tool Company of Cleveland 5, Ohio, announces the following executive promotions: Elmer J. Steger, manager of rock drill division; Charles E. Vanderpool, sales manager of pneumatic tool division; Albert H. Hruby, sales manager of rock drill division, and Robert Craig, manager of export sales.

Homestead Valve Manufacturing Co. of Coraopolis, Pa., has selected Don H. Krey as sales manager and Elliott G. Johnson as assistant sales manager.

Great Lakes Dredge & Dock Co., Chicago, Ill., has announced the recent election of William P. Feeley to its presidency.

Henry Lohse Company, Inc., Newark, N. J., is expanding its sales and service facilities in northern New Jersey with Fred Stoddard, formerly with Syracuse Supply Company, as its new general sales manager. Distributors of International Harvester industrial tractors, Bucyrus-Erie tractor equipment, and Austin-Western graders, the company placed a well-trained sales organization and parts department at Stoddard's disposal.

It's easier to lift, lower, push or pull the Simplex Way!

Simplex
LEVER · SCREW · HYDRAULIC
Jacks

for every construction purpose
Awarded the Gold Medal for Safety
Ask for Catalog 44
Templeton, Kenly & Co., Chicago 44, Ill.

Athey Truss Wheel Co. of Chicago, Ill., recently elevated B. F. Lease to its presidency. Mr. Lease, as vice-president, was in charge of sales, advertising, and service and is well-known to construction equipment distributors.

Worthington Pump and Machinery Corp., Harrison, N. J., has appointed the following firms as distributors in their respective areas: Clark-Wilcox Co., Boston, Mass.; Maine Truck Tractor Co., Portland, Maine; The Howard Corp., Clayton, Mo.; A. M. Flanders, Inc., Barre, Vt.; Milton-Hale Machinery Co., Albany, N. Y.; Landes Engineering Co., Salt Lake City, Utah; Coast Equipment Co., San Francisco, Calif.

Caterpillar Tractor Co., Peoria, Ill., recently announced the appointment of F. D. Haberkorn to assistant sales-manager of central division, C. A. Barabe, Jr., assistant sales-manager of eastern division, and the resignation of F. E. Rusher who now is associated with Peoria Tractor & Equipment Co. as its general sales-manager.

La Plant-Choate Mfg. Co., Inc., of Cedar Rapids, Iowa, has named K. V. Turner district representative operating from Washington, D. C., A. C. Cartwright to the Atlanta, Ga., territory, Milo Davin to central west territory with Cedar Rapids as headquarters, and S. L. Harris, formerly major with armed forces in India and China, to his old post as district representative in San Leandro, Calif.

Gardner-Denver Company of Quincy, Ill., has elected Alfred Kauffman a director. Mr. Kauffman remains a member of Link-Bent directors and board member of LaPlant-Choate and Cardox Manufacturing companies.

New trade literature

Title: **"Repair and Maintenance Catalog No. 45"**
Subject: New 48-page catalog with illustrations and listings of the various types and sizes of Simplex Jacks. Also included is a complete list of interchangeable parts for Simplex Jacks. This book not only facilitates the ordering of replacement parts, but also presents, with suitable illustrations, valuable suggestions for the maintenance, lubrication and repair of Simplex Jacks.
Where to Get: Templeton, Kenly & Co., Chicago 44, Ill. (Free)

Title: **"American Standards and War Standards"**
Subject: There are approximately 800 standards listed in the booklet, covering specifications for materials, methods of tests, dimensions, definitions of technical terms, procedures, etc., in the electrical, mechanical, building, and other fields. For ready reference, the standards are listed alphabetically as well as by engineering fields. This list represents the cumulative efforts of the past 26 years on the part of many organizations working through the American Standards Association.
Where to Gét: American Standards Association, 70 East 45th St., New York 17, N. Y. (Free)

Title: **"How to Repair Tractor Parts by Arc Welding"**
Subject: Illustrated bulletin telling how to repair various tractor parts by arc welding.
Where to Get: General Electric Co., Apparatus Dept., Schenectady, N. Y. (Free)

Title: **"Building Construction Cost Data"**
Subject: This 63-page booklet of tabulated cost data for 1945 is intended for use in making up engineering estimates on building construction. Useful in making preliminary estimates, in checking extras, or in appraisal work. The 900 items broken down for labor and material are arranged alphabetically and the booklet index-cut.
Where to Get: R. S. Means, P. O. Box 62, Duxbury, Mass. ($1.60 Postpaid)

Title: **"Moulded Fabric Bearing Bulletin"**
Subject: A 68-page brochure listing unusual performance qualities of Gatke moulded fabric bearings and describing advantages in meeting difficult and unusual service conditions. Also lists performance reports showing results under widely varying service conditions and illustrating numerous type and sizes in which Gatke bearings are being moulded to required dimensions for installation without machining.
Where to Get: Gatke Corporation, 228 N. LaSalle St., Chicago 1, Ill. (Free)

Title: **"Tournarope Wall Chart"**
Subject: A new wall chart, giving cable requirements for all LeTourneau equipment, prepared especially for operators and maintenance men. It stresses the service angle and gives practical tips on how to get longer service from wire rope. Chart measures 17 x 22 inches for hanging on field office or shop wall.
Where to Get: R. G. LeTourneau, Inc., Peoria, Ill.
Title: **"Caterpillar D-8 Diesel Tractor"**
Subject: New 32-page catalog thoroughly describing by words and pictures the Caterpillar Diesel D-8 tractor. Features of the 113 drawbar horsepower tractor and the diesel engine that motivates it are shown,

(Continued on page 472)

TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

Byers Bearcat crane equipped with 30' boom and Hercules gasoline engine. Located Central Indiana. Box 9251

1—80-B Bucyrus steam stripping shovel with 2½-yd. bucket, 48-ft. boom, 36-ft. stick in excellent condition. Reasonably priced.
2—1-yd. Marion steam shovels. Type No. 7.

Benjamin Coal Company
824 **Richmont St.** **Scranton 9, Pa.**

Model 100 Steam railroad shovel on Bucyrus-Erie caterpillar mounting, excellent condition, midwestern location. Box 3112

FOR SALE

Bucyrus Class 14 Steam Dragline No. 3493. Skid and roller machine equipped with 60' boom and 2 cu. yd. Page bucket. In good operating condition. Inspection invited. Located near Dallas, Texas. Box 3115

FOR SALE
Dragline Bucket
1—3-cu. yd. Type AY Heavy Duty
Bucyrus-Erie Dragline Bucket
Box 626 Emporia, Kansas

2T Bucyrus-Monighan dragline.
30B Bucyrus-Erie steam shovel.
18—Heavy duty International trucks with 8-10-yd. dump bodies.
The right equipment for pit, quarry and stripping operations.
Prices on request.

Stevens Bros. Coal Co.
St. Paul 1, Minn. and Garrison, No. Dakota

Welding and Cutting Outfits, Torches, Regulators and Gauges, for heavy, medium, and light welding and cutting. Superior Oxy-Acetylene Co., Hamilton, Ohio.

FOR SALE
ALL OR IN PART

SAND AND GRAVEL PLANT INCLUDING JAW CRUSHER, GYRATORY CRUSHER, CONVEYORS, VIBRATING SCREENS, SAND CLASSIFIERS, EXTRA HEAVY SCRUBBER, WATER PUMPS, SAND PUMPS, FEED-O-WEIGHTS, WEIGHTOMETERS, TRESTLE AND TRIPPER AND AUXILIARY EQUIPMENT.

ALSO

APPROXIMATELY 9 MILES OF CONVEYOR COMPLETE WITH BELTING, PULLEYS, TROUGHING AND RETURN IDLERS AND DRIVE EQUIPMENT.
ALL OFFERED SUBJECT TO PRIOR SALE.

FOR PARTICULARS WRITE

COLUMBIA CONSTRUCTION CO., INC.
BOX 579, REDDING, CALIFORNIA
TELEPHONE—REDDING 1440

Speeder combination loader or shovel on RD-6 Caterpillar tractor.

Dierks Lumber & Coal Co.—Dept. LG
1006 Grand Avenue **Kansas City, 6, Mo.**

NOTICE OF RECEIVER'S SALE

Notice is hereby given that Ben H. Sink, Receiver of the Possum Hollow Mining Corporation, by virtue of an order of the Circuit Court of Greene County, Indiana, will sell at private sale all the assets of said Possum Hollow Mining Corporation, which assets are generally described as follows:

A complete strip mine equipment, including steam shovels and all other incidentals connected therewith.

Said sale will commence on the 20th day of August, 1945, at the office of the Receiver in Jasonville, Indiana, and may be continued from day to day to and including 1st day of October, 1945.

Said sale will be for cash, and for not less than two-thirds the appraised value thereof. Information as to said sale, and description of assets, may be had from Ben H. Sink, Receiver, Jasonville, Indiana.

Ben H. Sink, Receiver
Jasonville, Indiana

DRAGLINE ATTACHMENT

Removed from 75-B Bucyrus-Erie Electric Shop No. 11595. 2 Piece 60' lattice boom. Capacity 40 tons at 20'. Complete with control motor, drum and fairleads. Immediate shipment.

ATLANTIC EQUIPMENT COMPANY
583 Broad St. Station Bldg. **Phila. 3, Pa.**
(Rittenhouse 8583)

SURPLUS DIPPERS FOR BUCYRUS-ERIE SHOVELS

2—⅜ cu. yd. Skimmer Scoop Dipper—10-B.
2—½ cu. yd. Drag Shovel Dipper—17-B.
3—½ cu. yd. Skimmer Scoop Dipper—17-B.
1—¾ cu. yd. Welded Dipper—21-B.
1—1 cu. yd. Drag Shovel Dipper—29-B.
1—1¼ cu. yd. Cast Front Dipper—GA-3.
1—1¼ cu. yd. Drag Shovel Dipper—33-B.
1—1½ cu. yd. Heavy Duty All Cast Dipper—42-B.
1—1½ cu. yd. Snow Loading Dipper—10-B.
1—1½ cu. yd. type 4 Med. Duty Dipper.
1—2 cu. yd. Rock Dipper—75-B.
1—2¼ cu. yd. Inserted Type Dipper—50-B.
1—2¼ cu. yd. Inserted Type—55-B.
1—2½ cu. yd. All Cast Dipper—55-B.
1—3½ cu. yd. Coal Loading Dipper—75-B.
1—4 cu. yd. Type IV Medium Duty Dipper—100-B.

F.O.B. Works
Write for any further information desired.

BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee **Wisconsin**

Low bottom equipment semi-trailer.
1—40 ton 16 wheel
1—25 ton 8 wheel
1 highway dump trailer
2 Fruehauf cattle trailers
Phone 6417 Reading
L. J. Hughe **422 Chestnut Street**
Reading, Pennsylvania

Bucyrus-Erie 50B steam 2¼-yd. shovel, No. 10635, 26' boom, 17' sticks, manganese rock dipper, steel cab; 100% rebuilt; guaranteed; Sept.
Porter 18-ton & Vulcan 17-ton steam 36" gauge S/T locomotives, 100% rebuilt, tested.
Milwaukee 8-ton gas locomotive, 36" ga., A-1.
Vulcan 18-ton steam S/T locomotive, 42" gauge.
Whitcomb 8-ton gas locomotives (4), 24" gauge.
Baldwin and Lima steam logging locomotives, 58, 56, 50, 42 and 40 tons, std. gauge, (5).
Marion electric 4-yd. and 3-yd. shovels.
P&H 206B crane, gas, 40' boom, ¾-yd. bkt.
Draglines 2 and 3-yd. Diesel, electric.
American steam railway ditcher-crane, 28' bm.
Fairbanks-Morse 240 HP Diesel engine, Model 44.
Gyratory Crushers: 27" Gates, and 21" type K.
Cedar Rapids travel type asphalt plant.
Euclid 6-yd. bottom dump crawler wagons (8).
Hydroelectric gen. plants, 35', 65', 150' heads.
Gold Placer Dredge, 7½', electric, wood, 28'.
Bucyrus 30' shovel boom only, for 50B machine.
Boiler tubes, 236—1¾"x5', ferrules (new).

H. Y. SMITH CO.
828 N. Broadway **Milwaukee 2, Wis.**

1—Used ¾-yd. Page dragline bucket, in good condition, like new. Priced right for quick sale.
Phone, write, or wire:

GARSON IRON & STEEL CO.
512 Lyceum Bldg., Duluth 2, Minnesota
Melrose 222

Two ¾-yd. Bucyrus-Erie AU dragline buckets and one ¾-yd. Page Type M dragline bucket, including all chains and fittings. Located Central Illinois. Box 3119

Bucyrus-Erie trailer. Will accommodate 10-B to 22-B. Tires 95% new Goodyear YKL 900x20 10-Ply front, 10:00x20 12-Ply rear.

J. M. Robertson
Oneonta, N. Y.

Single rope crowd shovel front end equipment consisting of 13'6" shovel boom, 11' dipper handle and ⅝-yd. dipper suitable for 10-B Bucyrus-Erie serial No. 14761 or earlier. Box 9250

Shovel front end equipment consisting of 22' boom, 17' handle and 1¼ yard dipper together with chain crowd operating machinery suitable for Bucyrus-Erie 43-B. Box 3113

MECHANICS step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully Illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 days' Free Examination. Send No Money. Nothing to pay postman. ( ) Marine $4, ( ) Blueprint $2, ( ) Machinist $4, ( ) Electricity $4, ( ) Shipfitter $1, ( ) Welders $1, ( ) Radio $4, ( ) Plumbers $6, ( ) Diesel $1, ( ) Carpenters $6, ( ) Mathematics $2, ( ) Auto $4, ( ) Sheet Metal $1. If satisfied you pay only $1 a month until purchase price is paid. AUDEL, Publishers, 49 West 23rd St., New York 10, N. Y.

"Building Construction Cost Data"
1945 Issue

A 63-page booklet of tabulated construction costs. 900 items broken down for labor and material. Arranged alphabetically and index cut A to Z. Concise, Comprehensive, and Up-to-date. $1.60 postpaid, R. S. Means, P. O. Box 62, Duxbury, Mass.

¾-yd. Michigan truck crane equipped with crane boom or back hoe. Could use ¾-yd. ¾-swing wheel-mounted Bay City crane. Box 3118

1¼ or 1½-yd. dragline with approximately 60' boom. Diesel power preferred. Box 3116

Trucks: 15-ton, rear dump, rock bodies, Diesel, 4-wheel drive preferred.
Shovels: One 2½-yd. and one 1-yd. Diesel, late models.
Locomotive: 25-30 ton, std. gauge, gas or Diesel. Box 3117

HELP WANTED

CRANE OPERATOR WANTED

Experienced crane operator to work in Milwaukee, Wis. Must be familiar with P&H or Koehring equipment and be able to make minor repairs. Good, steady working conditions. WMC rules. Box 9243

Expert operator for large steam driven stripping shovel in South America. Box 9246

Dragline Operator wanted by Mining Company in Colombia, South America. In replying state age, draft status, experience, references, etc. Box 9248

HELP WANTED

F. A. Howe, Superintendent, Fall Brook Coal Co., Antrim, Tioga County, Pennsylvania, has steady jobs available for operators and cranemen experienced on 320-B steam shovel.

CONSTRUCTION SUPERINTENDENTS wanted by old, well-established contracting firm. Heavy Grading, earth and rock. Drainage, wet and dry. Concrete Paving, highway and airport. Concrete Structures, heavy and highway. Give complete history with reference and qualification for any of foregoing classifications. Box 9249

WANTED

Manager for our Machinery and Equipment Dept. Experienced with machinery and equipment used in heavy industries—like cranes, ground and overhead; steel buildings and structures, power plants, mining, contractors, etc. Drawing account and participation. Unusual opportunity for good high grade man. Confidences respected.

IRON & STEEL PRODUCTS, INC.
40 years' experience
13474 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

POSITIONS WANTED

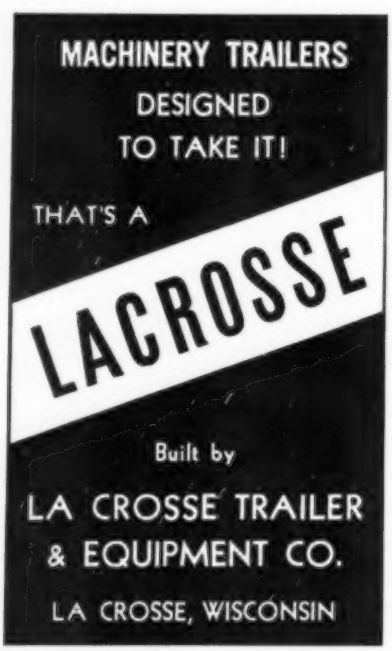
Operator: Wants job operating shovel. Have 18 months experience on small shovel operation in army. Also pre-war experience with State Highway Dept. Age 28, single, honorable army discharge. Will go anywhere, including foreign country. Willing worker who wants to make operation and excavating industry his life work. Box 9247

New Trade Literature

(Continued from page 470)

along with views of the product in action on many jobs.

Where to Get: Caterpillar Tractor Co., Peoria, Ill. (Free) Request Form 8869.



Title: "G. I.'s Opportunity"

Subject: True stories of 34 men who achieved great things from small beginnings spur men to own their own businesses after reading this helpful book. The returning G. I. should find it helpful, and others will reaffirm their faith in America's free enterprise.

Where to Get: Adventures in Business, Knott's Berry Place, Buena Park, Calif. (25 cents)

Title: "Supercharging"

Subject: How supercharging all engines including diesels increases efficiency by decreasing engine weight and increasing power is told in this story of the unit which gained fame in war. Tells how supercharging may be installed in power shovels, tractors, trucks, industrial engines, marine engines, etc.

Where to Get: B-W Superchargers, Inc., Milwaukee, Wis. (Free)

Title: "Modern Mileage Makers"

Subject: A new eight-page color booklet explaining how Caterpillar equipment is used in rock crushing, scraping, gravel loading, grading, etc.

Where to Get: Caterpillar Tractor Co., Peoria, Ill., Form 8927. (Free)

Title: "101 Welding Ideas For Low-Cost Maintenance"

Subject: Applications of welding in excavating and heavy machinery equipment are photographically illustrated with explanations and drawings of "in the field" solutions to 101 operating problems. An excellent 18-page book to refer to for money-saving ideas.

Where to Get: The Lincoln Electric Company, Cleveland, Ohio. (Free)

Title: "Goodyear On the Job".

Subject: The story of Goodyear tires on all fronts, on all jobs, is dramatically told in this beautifully illustrated 24-page book. Emphasis is laid on various styles of tires for specific jobs, but an additional section deals with tire manufacture and a 12-point chapter discusses tire care.

Where to Get: The Goodyear Tire and Rubber Company, Akron, Ohio. (Free)

Title: "Euclid Trucks in Mines and Quarries"

Subject: This 32-page booklet contains natural color as well as black and white illustrations of 16 mine and quarry operations in many sections of the United States. The book highlights typical applications of Rear-Dump and Bottom-Dump Euclids in open pit mining of iron ore, bauxite, titanium, cinnibar, manganese, phosphate, anthracite and bituminous coal, and in dolomite and limestone quarries a source of constructive ideas for efficient moving of earth, ore, coal and other materials.

Where to Get: The Euclid Road Machinery Co., Cleveland 17, Ohio. (Free to those who use off-the-highway equipment for mining and quarrying.)

Title: "Genuine Crosby Wire Rope Clip"

Subject: In addition to full construction details of the important wire rope clip, this 20 page booklet contains fastening instructions and a table of quantities to use with various size rope.

Where to Get: American Hoist & Derrick Co., Saint Paul, Minn. (Free)

Title: "AED Compilation of Rental Rates for Construction Equipment"

Subject: In cooperation with Maximum Price Regulations 134 and 136 of OPA, the Third Edition of the "Green Book," as it is known to the industry, lists the rental rates on construction machinery. Bold-face type, new arrangement in classifications, and a breakdown of accessory equipment make this book a "must" for all who rent excavating construction equipment.

Where to Get: Associated Equipment Distributors, National Press Building, Washington 4, D. C. ($2.00)

Title: "Power Points"

Subject: The "world-wide news of Onan engine-generator sets in action" is graphically portrayed in this bi-monthly publication. Interesting anecdotes of the equipment in operation on battle fronts and at home are told along with new ideas on maintenance and repair.

Where to Get: D. W. Onan & Sons, Minneapolis, Minn. (Free with request on your letterhead)

Title: "Newsfront"

Subject: A monthly report of the things Westinghouse is achieving in scientific research is presented in this four page booklet. Illustrated with drawings and photographs, the book is sent monthly to all on the mailing list.

Where to Get: Editor, Westinghouse "Newsfront," 306 Fourth Ave., Box 1017, Pittsburgh, Penn. (Free)

Title: "Pioneer Washing Plants"

Subject: The advantages of portable gravel washing plants in the operations of feeding, handling, washing, screening, dehydrating, storage, and crushing are described in this 20 page book. Twenty-three typical operations are photographically illustrated with detailed descriptions of each job.

Where to Get: Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn. (Free)

Title: "Suction Hose"

Subject: This four-page catalog insert describing hose for excavating purposes tells the story of patented processes, construction facts, and other details of six grades of suction hose.

Where to Get: B. F. Goodrich Company, Akron, Ohio. (Free)